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## Inside Dope

By GEORGE F. TAUBENECK

*Learn to live and laugh — thus delay your epitaph*

**Story of the Week**
**It's an Unfunny Business**
**They Make Weather**
**Why Manufacturers Grow Gray**
**Serviceman's Nightmare**
**Happy Chickens**
**Hot Umpires**
**How to Find Your Auto**
**Wayward Installer**
**Air Conditioning, Poker, And Singapore**

### *Story of the Week*

"Now, son, I want you to remember you can do anything you want to do if you want it hard enough. You can be anything you desire if you desire it enough. The key to success is desire and hard work," father sermonned.

"You don't say," innocented sonnyboy. "Then if grandma wanted to bad enough, and worked hard, she could be heavyweight boxing champion of the world?"

### *It's an Unfunny Business*

Every once-in-awhile we get an urgent request from a subscriber which goes like this: "Am making a speech on air conditioning next Tuesday. Please send me a funny air conditioning anecdote."

Rarely can we comply. You see, air conditioning is an exceptionally unfunny business. It tends to breed troubles and heartbreaks rather than humor. Which is one reason "Dope" tries to relieve the seriousness of the NEWS with a couple of jokes each week.

However, to oblige magazine writers for *Look* and the *Saturday Evening Post,* recently we made an extensive search for humorous and human interest anecdotes about this business. Herewith are some of the best this research uncovered. Please save them for future reference.

### *They Make Weather*

Warm spring weather promted a Tulsa retailer to put in an elaborate window display of room air conditioners on a Friday. Saturday a blizzard struck.

After church Sunday the proprietor put a sign in his window:

"Sorry about the unexpected cold weather. We forgot to turn off these air conditioners."

### *Why Manufacturers Grow Gray*

Detroit's spanking new City-County building is fully air conditioned, with individual controls. Auditor Charlie Edge-

*(Concluded on Page 16, Col. 1)*

## Contractors vs. Sheet Metal Men: Bargaining In L.A., Suing In Denver

LOS ANGELES, Aug. 1.—Collective bargaining showed signs of progress during the fifth week of strike conditions in the sheet metal and air conditioning industry in southern California.

An employer representative said a "very good" meeting was held Tuesday. The union came up with a demand based on a four-year contract, which has opened up a new channel.

By mutual consent, no figures were released in connection with the new proposal. Next meeting was set for Friday, Aug. 2.

The restraining order obtained by the associations against members, card signers, and nonmembers has been continued in effect until Aug. 5. Superior Court Judge Bayard Rhone, at the request of some of the parties, continued the hearing on the preliminary injunction to the Aug. 5 date.

Since the restraining order remains in full force, proceedings have been initiated for contempt citations against employ-

*(Concluded on Back Page, Col. 1)*

DENVER—Eight members of Local No. 9 of the Sheet Metal Workers International Association of Denver were sued for $110,000 damages in District Court by the Sheet Metal & Warm Air Heating Contractors Association.

Named as defendants were Robert Sands, John Schneider, Louis Boh, George J. Jeffries, LeVerne Mores, Oliver Nelson, Harold Lay, and Kenneth St. John, assistant business agent.

The suit asserted that during contract negotiations before June 30, representatives of the

*(Concluded on Back Page, Col. 1)*

## Elect T. I. Byrd Lau President

DAYTON — Thomas I. Byrd, former executive vice president of The Lau Blower Co. here, was elected president and Harold W. Faulkender, former president, was elevated to chairman of the board at a recent meeting of the board of directors.

T. I. Byrd

Faulkender said the new arrangement reflects plans for broadening the company's operation.

"We expect to secure new military business as well as enlarge our product lines into other fields besides our main one

*(Concluded on Page 37, Col. 4)*

## *Big Three Hike Aluminum Prices*

NEW YORK CITY—The big-three producers of aluminum—Aluminum Co. of America, Reynolds Metals Co., and Kaiser Aluminum & Chemicals Corp.—announced price increases on pig aluminum and other aluminum products, effective Aug. 1.

The hikes were made to cover wage increases effective Aug. 1, under a three-year contract between the aluminum companies and the AFL-CIO United Steelworkers Union, according to spokesmen for the companies.

Announced increases were uniform, at one cent pound for pig aluminum and about 4% on other products.

## *Beer Case Sales Foam Up To All-Time High for Evans*

MT. VERNON, N. Y.—Sales of beverage refrigerator cases for display and sale of bottled and canned beer have reached an all time high for Evans Mfg. Corp. here.

Joseph Eventoff, president, revealed that the volume of refrigerator cases produced for the beer trade has doubled that of last year—to nearly 1,000 cases in the past six months.

An equal number is expected to be produced to meet demands for the balance of the year, he said.

The majority of orders received, Eventoff disclosed, have been for medium capacity, wall-

*(Concluded on Back Page, Col. 5)*

## BEHIND PAGE ONE . . .

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## Variety of New Items To Bow at 10th Air Conditioning, Refrigeration Show

WASHINGTON, D. C.—Many new items will be shown for the first time at the 10th Exposition of the Air Conditioning and Refrigeration Industry, according to show director George E. Mills.

The show will be held in Chicago's mammoth International Amphitheater, Nov. 18 through 21.

Here's a run-down on some of the products to be exhibited:

A new door gasket for use with the new safety type spring and magnetic refrigerator door locks, and a closed cell sponge tubing for insulation on hot and cold lines will be displayed by one firm.

Also to be shown: a new product to aid quicker application of foam type insulation to pipes; a brand new compressor for low pressure refrigerants said to include a host of design and construction features never before available to the industry; a new complete replacement capillary assembly in kit form; new 1958 model home freezers

*(Concluded on Page 39, Col. 1)*

**Heating Section**

HEATING SECTION starting on page 28 offers news and ideas for anyone in, or interested in getting into, heating. Articles on page 28 tell of a solar heating system in an Albuquerque building, and how air conditioning is paving the way for electric heating. On page 29 James F. Deane urges heating men to "let the public know what we can do." H. C. Gurney discusses gas unit heaters for commercial and industrial applications in his column, Winter Air Conditioning Fundamentals, on page 30. Questions on oil burner nozzles are answered on page 31 by Robert Hundley.

## NAPC Fights Bid Shopping Bill In Senate

### *Claims Provisions Hurt Specialty Contractors*

WASHINGTON, D. C.—Opposition to the present form of the "anti-bid shopping" bill now in the hands of the Senate Judiciary committee was voiced recently by the National Association of Plumbing Contractors.

The bill is officially Senate Bill 2300 entitled "Federal Construction Contract Procedures Act." Its companion, House Bill 7168 was passed by the House of Representatives on June 24.

Wilbur S. Hokum, president of NAPC, sent a letter July 30 to Sen. Alexander Wiley (Wisconsin Republican), a member of the committee, throwing the weight of NAPC against the bills. He listed four objections to the bills and urged hearings "in the event the judiciary com-

*(Concluded on Page 37, Col. 1)*

## Mitchell Ups Haas As Tracey Leaves

HOWARD G. HAAS

E. A. TRACEY

CHICAGO — Appointment of Howard G. Haas as vice president in charge of sales for the room air conditioner division of Mitchell Mfg. Co. was announced by J. W. Alsdorf, president.

Formerly vice president in charge of advertising and sales promotion, Haas succeeds E. A. Tracey, who has joined Emerson Radio & Phonograph Corp. as vice president in charge of sales. Tracey succeeds Hal R. Dietz, who recently resigned to join Union Cycle, Ltd., Brooklyn.

Haas was first associated with Mitchell in 1950 as director of advertising and sales promotion and became a vice president in 1954. He previously had been associated with Esquire, Inc.

## Cooling Off: *Rambunctious Rams . . . Football Fans*

**One way to halt the expected** filibuster on the Civil Rights bill in the Senate would be to turn off the air conditioning. Some think that this is the only way to get Congress to adjourn.

* * *

**The Yankees, kings of the** American League, are now living like one. They have installed air conditioning in their dug-out at Yankee stadium. Visiting teams, however, will continue to sweat it out in the dug-out as well as on the field.

* * *

**This is Texas?** Baylor university has installed a "pink Cadillac row" in the grandstand of its football stadium in Waco. The air conditioned 85 seat section will also have—for delicate football fans—tile floors, foam cushions, heaters, and potted plants in the corners. It will be reached by elevator!

* * *

**Researchers have found** that if a ram is kept in an air conditioned shed during the day, he will be as frisky as necessary when released among the ewes

*(Concluded on Back Page, Col. 3)*

Know where you're heading . . . Insist upon READING!

READING COPPER TUBING truly trouble-free for Refrigeration & Air Conditioning Equipment

And RED BRASS PIPE

Made by Copper Tube SPECIALISTS

READING TUBE CORPORATION
EMPIRE STATE BUILDING NEW YORK 1, N. Y.
WORKS: READING, PA.

## Jennings To Direct Research for ASHAE

NEW YORK CITY—Appointment of Prof. Burgess H. Jennings, Evanston, Ill., as director of research for the American Society of Heating & Air-Conditioning Engineers was announced by ASHAE President P. B. Gordon.

The Council of the society approved this appointment during the ASHAE semiannual meeting held at Murray Bay, P. Q., Can.

Prof. Jennings will assume his new responsibilities about the middle of August, directing operations of the society research program both at the ASHAE Research Laboratory, Cleveland, and at cooperating institutions.

Since 1942 Prof. Jennings has been chairman of the Department of Mechanical Engineering, The Technological Institute, Northwestern university, an appointment he has resigned to become the ASHAE research director.

He has been actively engaged in education for over 30 years, serving on the staff of Lehigh university from 1926 to 1940, obtaining the rank of associate professor and serving as director of the Mechanical Engineering Laboratories. He received his appointment as professor of mechanical engineering at Northwestern university in 1940.

Prof. Jennings has been an active consultant from early in his professional career.

Because of his activity in research work, Prof. Jennings has pursued many interests in the fields of thermodynamics, psychrometry, human engineering, fluid flow, gas turbines and compressors, ventilation and air conditioning, and atomic energy.

He is the author of some 25 research papers and articles and he currently has several additional papers in preparation. The new ASHAE director of research has also found time for editorial activities in his field.

Past president of the American Society of Refrigerating Engineers, Prof. Jennings has served this society on many committees and in other capacities. A member of the ASHAE since 1942, he has served with the Guide Publication Committee 1947-48 and 1950-51 and chairman in 1952. He has also served on other society committees.

KRAMER "F" THERMOBANK OPENS A NEW ERA IN REFRIGERATION OF FRESH FOODS

A NEW THERMOBANK DESIGNED SPECIFICALLY FOR FRESH FOOD

For years, research and experience in the fresh food storage field have emphasized that most fresh food can be kept in salable condition for considerably longer time when stored at 30° to 32° with a minimum variation of temperature and humidity. The new "F" THERMOBANK provides, for the first time, an economical refrigeration system for fresh food at the 30° to 32° level and it embodies all the valuable features of the THERMOBANK re-evaporative hot gas defrost system that have made THERMOBANK the standard of the industry.

LIFE OF FRESH FOOD EXTENDED
With the old "off-cycle" defrosting, there are continual wide temperature and humidity fluctuations and it is not possible to maintain temperatures below 35°. The new "F" THERMOBANK eliminates "off-cycle" defrosting and maintains constant temperature and humidity by operating with the fewest possible defrost periods of the shortest possible duration; "F" THERMOBANK means less waste, longer shelf life, less dehydration, less mold and bacterial infection and retention of "freshness" during storage.

"F" THERMOBANK COSTS LESS
Because the "F" THERMOBANK guarantees rapid and complete defrost, equipment is safely selected for 20 hours operation. This results in the selection of a smaller THERMOBANK system and a smaller compressor giving low first cost and economical operation.

WRITE FOR BULLETIN TV-380

KRAMER TRENTON CO.
TRENTON 5, NEW JERSEY

43 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

## *Payne Closing Down for Vacation and Move from Aug. 15 Through Sept. 4*

MONROVIA, Calif. — In announcing its vacation shutdown date, the Payne Co. also announced its forthcoming move to new quarters in Puente.

The vacation shutdown for both plant and office will be from Aug. 15 through Sept. 4. Moving will be accomplished during this time, with no more interruption in production or shipments than is usual during the annual vacation shutdown, the company said.

## A. O. Smith Purchases Newark, Calif. Plant

NEWARK, Calif.—The former Rheem-Wedgewood plant here was recently purchased by A. O. Smith Corp. of Milwaukee.

Sale of the 275,000-sq. ft. plant was confirmed by Clarence Kane, executive vice president of United States Leasing Corp., which purchased the plant late last year from Rheem for $500,000. However, Kane declined to disclose further details.

A Smith spokesman in Oakland stated that production in the plant could not possibly begin until next year as extensive changes will be required to ready the plant.

SEND FOR REPRINTS
Product Knowledge, Protective Maintenance, Trouble-Shooting, Adjustment, Repair of Electric Motors.
Only 40¢ each.
For your copy, clip this ad and mail with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich.



*For more information about products advertised on this page use Information Center, page 22.*

## SOARING TO NEW HEIGHTS

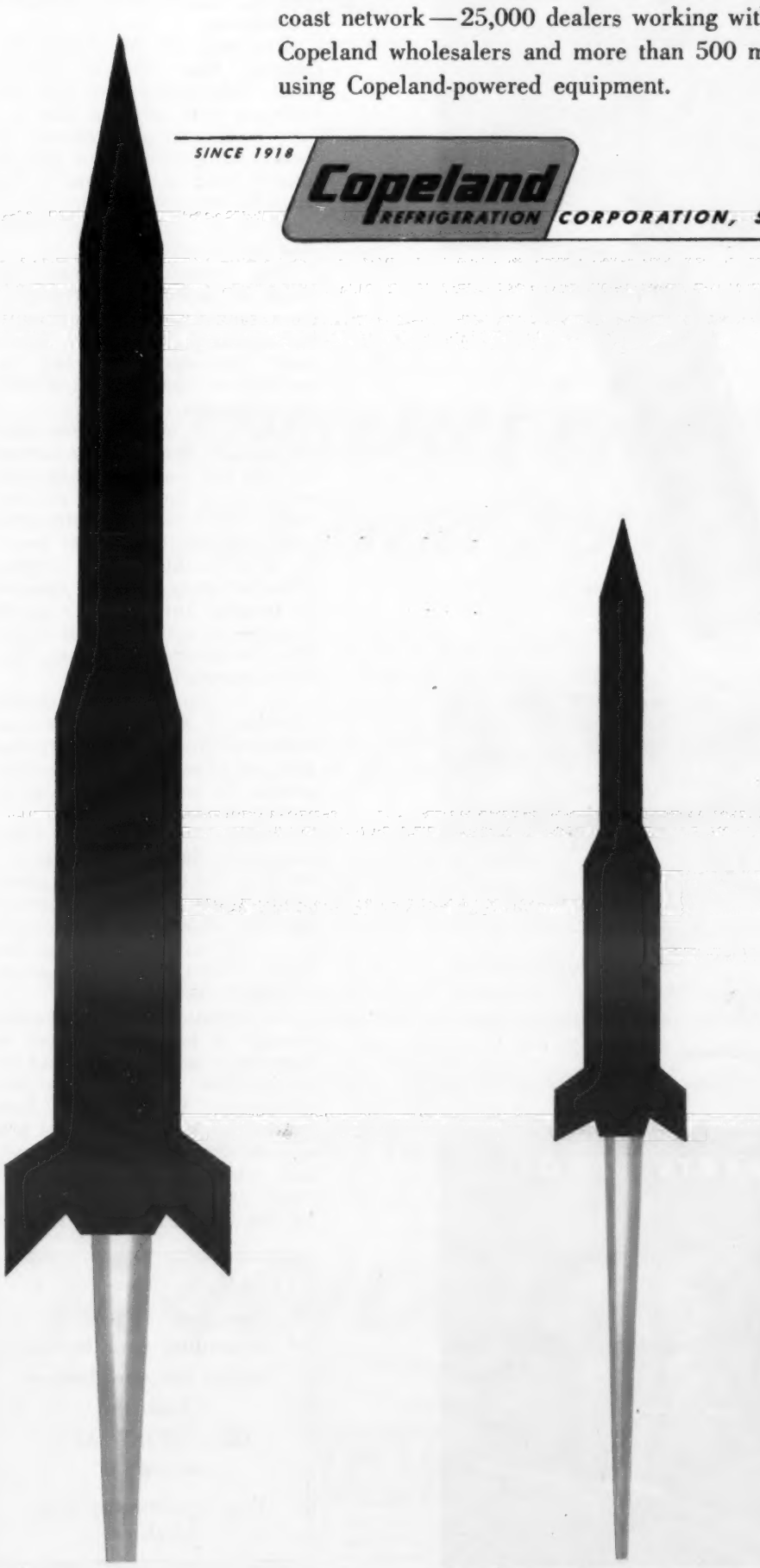
It's up, up, up at Copeland . . . a continuous record of progress in every phase of the manufacture and distribution of highest-quality refrigeration units.

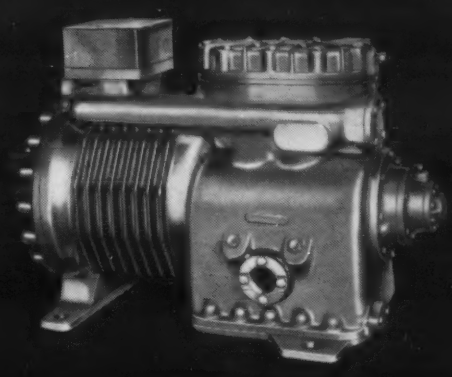
A new factory lifts our production to new heights of distinction. It also speeds up complete parts and replacement service. Thus all who handle and use Copeland equipment greatly improve their inventory position and can free working capital previously tied up.

The future grows brighter all the time for our coast-to-coast network—25,000 dealers working with nearly 150 Copeland wholesalers and more than 500 manufacturers using Copeland-powered equipment.

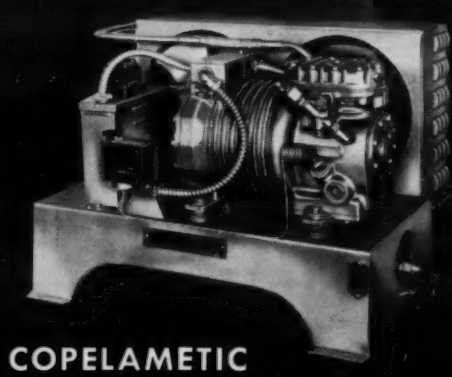
SINCE 1918 **Copeland** REFRIGERATION CORPORATION, Sidney, Ohio

LIVE BETTER ELECTRICALLY

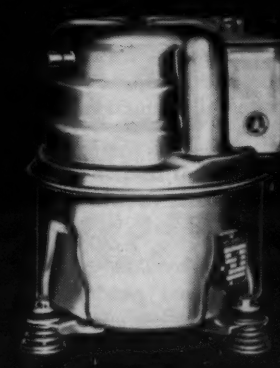




COPELAMETIC MOTOR-COMPRESSORS



COPELAMETIC CONDENSING UNITS



COPELAWELD MOTOR-COMPRESSORS

BELT-DRIVEN CONDENSING UNITS

*For more information about products advertised on this page use Information Center, page 22.*

## Oscillating with Gibson

C. J. GIBSON, JR., president of Gibson Refrigerator Co., a division of Hupp Corp., demonstrates "Air Sweep" feature he helped originate for Gibson room air conditioners. Models set up in dealers' showrooms with streamers attached to show the air flow pattern through oscillating louvers are described as sure shopper-stoppers. "The moving display fascinates the customer, and the utility of the gentle oscillating action sells them," Mr. Gibson comments.

## *Norge Refrigerator, Freezer Sales up 10%*

CHICAGO—Unit factory shipments of Norge refrigerators and home freezers for the first six months rose 10% over the corresponding 1956 period, it was reported.

Full line Norge home appliance unit volume during the second quarter jumped 31% ahead of the 1956 quarter, according to Judson S. Sayre, president of this division of Borg-Warner Corp.

"Refrigerators and home freezers were shown to dealers by distributors during the middle of February and as a result, did not make their strength felt until the second quarter," he noted.

"Marketing geared to a consumer trend for more than 11-ft. and two-door models accounted for the refrigerator increase."

*For Frozen Food Handling*

## NAFFP Prepares Questionnaire To Gather Data as Basis for Model Regulation

WASHINGTON, D. C. — A questionnaire on frozen food handling in retail stores is being prepared by the National Association of Frozen Food Packers for use in gathering data from stores soon.

The data will be used as a basis for a model frozen food handling regulation to be discussed by the Association of Food & Drug Officials of the United States.

NAFFP hopes to forestall AFDOUS action which might prove unduly restrictive for the industry, it was reported.

NAFFP is gathering data, in cooperation with the USDA Federal Extension Service, on retail handling so that any regulation which might be adopted would be based upon actual conditions.

Also, the survey is expected to provide data which can be used by an all-industry committee in a coordinated educational program aimed at improving frozen food handling.

## AGA Committee To Support Gas Air Conditioning Mfrs.

NEW YORK CITY—Immediate steps to support the gas air conditioning programs of all manufacturers in the field have been initiated by the American Gas Association's newly-organized Air Conditioning Promotion Committee.

Chairman W. W. Selzer, Columbia Gas System Service Corp. here, declared at the committee's first meeting that gas air conditioning presents an enormous potential for the industry and that "now is the time for immediate action on the part of the utilities in selling gas air conditioning."

The committee's broad program is based on coordinating the stepped-up efforts of industry research committees, equipment manufacturers, and the promotion organizations of utility companies.

"As one of its immediate goals, the committee has decided to help one leading manufacturer promote the sale of an estimated 4,600 gas air conditioning units during the present year," it was pointed out. "Other manufacturers will be assisted in tapping the huge air conditioning potential in the industrial, commercial, and residential markets."

C. S. Stackpole, managing director of AGA, told the committee members they constituted one of the most important groups to be formed in the industry in many years.

"There has been a real awakening in the gas industry," he said, "to the fact that something must be done quickly about promoting and selling gas air conditioning equipment. Gas utilities are going into air conditioning in real earnest."

Organization of an idea exchange to help utilities set up aggressive sales and service organizations within their own companies has already been started as a result of the new committee's actions. Utility ads and promotional materials currently in use are being collected by the AGA Promotion Bureau.


WOLVERINE SERVES THE REFRIGERATION INDUSTRY...

WITH WOLVERINE TRUFIN®

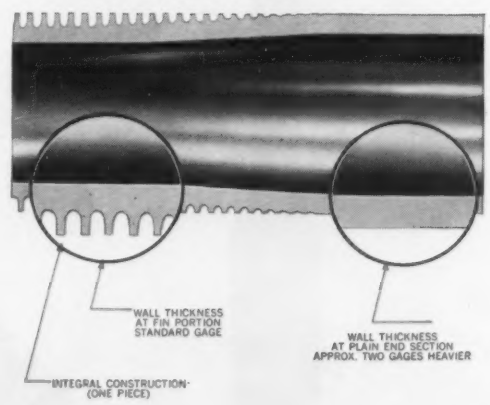
In refrigeration equipment . . . air conditioning equipment . . . wherever maximum BTU extraction is desired . . . there you will find applications made to order for Wolverine Trufin®—the integrally finned tube.

Trufin—because it has integral fins—has approximately 2½ times the surface area of an equivalent length of plain tube of similar O.D. This is an increase of 150% in outside surface and permits the transfer of more BTU's per foot of tube. The result is that smaller, more effective condensers can be designed with a substantial savings in both space and material costs.

This is only ONE of the specialized products designed and produced by Wolverine Tube from its years of experience as a leading supplier to the refrigeration and air conditioning industries.

There is, for example, tiny, plug-drawn Wolverine Capilator®, the capillary tube for precision metering of gases or liquids. Also available—in coils of varying lengths—is Wolverine's rigidly quality-controlled copper refrigeration tube. In addition to manufacturing both copper and aluminum tube in a wide range of sizes and alloys—Wolverine also maintains complete fabricating facilities—is equipped to fin, spin, bend, bead, coil, flare and expand tubing—to name but some of the techniques available.

Next time your requirements call for tubing or tubular-shaped parts remember that Wolverine Tube grew up with your industry—knows its needs at first hand. For more information write for Wolverine's new book "Wolverine Serves The Refrigeration Industry."


WALL THICKNESS AT FIN PORTION STANDARD GAGE
WALL THICKNESS AT PLAIN END SECTION APPROX. TWO GAGES HEAVIER
INTEGRAL CONSTRUCTION (ONE PIECE)

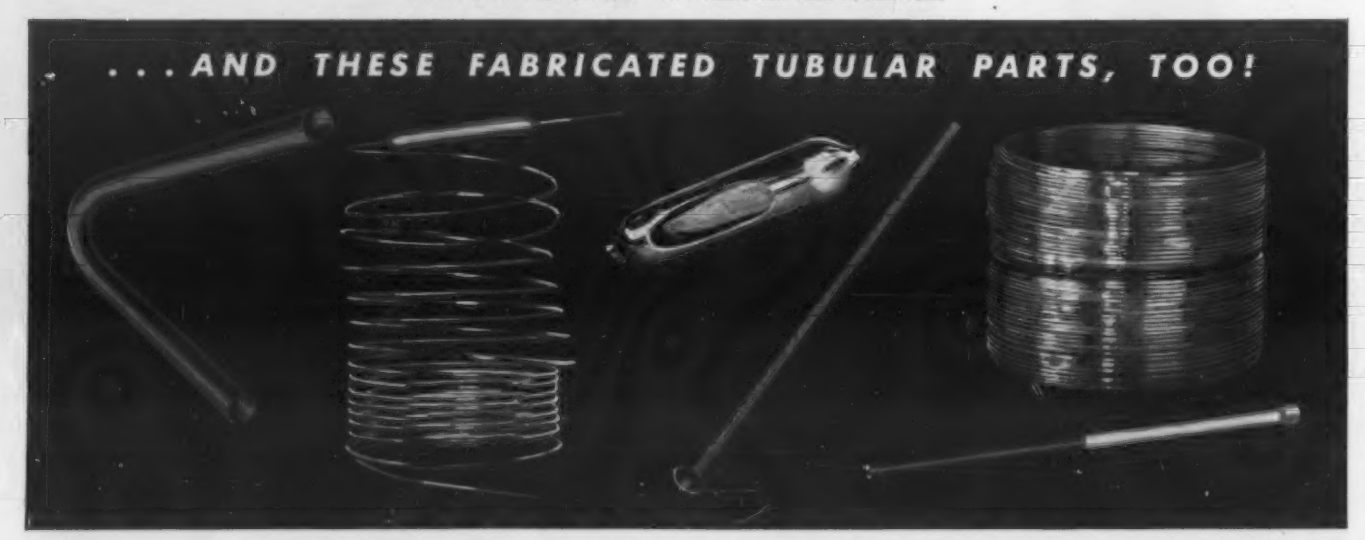
CALUMET & HECLA, INC.
CALUMET DIVISION
WOLVERINE TUBE DIVISION
FOREST INDUSTRIES DIVISION
GOODMAN LUMBER COMPANY
CALUMET & HECLA OF CANADA LIMITED
CANADA VULCANIZER AND EQUIPMENT COMPANY LIMITED

WOLVERINE TUBE
Division of Calumet & Hecla, Inc.
1413 CENTRAL AVE., DETROIT 9, MICH.
Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

Wolverine Trufin is available in Canada through the Unifin Tube Company, London, Ontario.

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, NEW YORK





*Thinking of —*
- **changing territories**
- **expanding your territory**
- **taking on new lines—**

Check the **CLASSIFIED ADS** on page 38

*Your opportunity may be there.*



*For more information about products advertised on this page use Information Center, page 22.*

# FRIGIDAIRE OFFERS A HELPING HAND FOR EVERY DEALER SERVICE PROBLEM

A handy man to have nearby is the Frigidaire Service Representative. Though equipped with only the usual number of arms, he performs a half-dozen different duties, and then some, to help dealers maintain the highest service standards in the industry.

This master of all phases of service is just one of the reasons for the continuing growth of nearly 10,000 independently-owned Frigidaire dealer service operations. Daily, he helps to carry out the basic Frigidaire formula for service success: Everything the dealer needs, when and where he needs it! Complete factory and district support, providing the answer to every service problem.

Look how Frigidaire backs up this service program—

- Parts availability through strategically located warehouses.
- Organization and operation plans and assistance through district personnel who are familiar with local dealer conditions.
- Service programs and promotions to improve customer relations, including direct mail, point-of-sale and newspaper advertising.
- Up-to-date service, technical and parts information.
- Specialized training programs, skill-building GM Training Centers, Home study courses and training films.
- Special tools and test equipment, plus counsel and advice in planning whatever type of shop best fits your needs.

Is it any wonder that Frigidaire dealers have been successful—with service as well as sales?

## IN SERVICE ASSISTANCE AS IN SALES

# FRIGIDAIRE is on the march

GM GENERAL MOTORS

Frigidaire—Built and Backed by General Motors

*For more information about products advertised on this page use Information Center, page 22.*

**For Outstanding Sales**

## *Ten Airtemp Distributor Principals Will Get Air Conditioned Imperials*

DAYTON — For outstanding 1957 sales achievement, ten Airtemp distributor principals will be awarded completely equipped, air conditioned Chrysler "Imperials," Sydney Anderson, Jr., manager, air conditioning and heating sales, announced recently.

### FALL PRESENTATION

The Imperials will be presented this fall when the company holds its first national business conference Nov. 11-13 at the Edgewater Gulf hotel, Edgewater Park, Miss., it was pointed out.

Distributors participating in Airtemp's 1957 Achievement Award Program have been divided into five teams — the "Dialers," "Springtimers," "Anytimers," "Chryslers," and "Airtempers." A distributor, to qualify as a possible recipient of one of the luxury cars, must sell "100% of objective" in each of six cooling and heating major product categories.

### SPECIAL PLAQUES

A special plaque signifying superiority of achievement will be presented to the heads of all firms attaining the 100% mark in all of the product classifications.

"Grand Award" Imperials will go to the principals of the two companies in each of the five team-groups who sales exceed 100% by the widest margin, according to the firm.

*Tenants Agree to Rent Boost*

## 250 Tons of Packaged Air Conditioning Helps Modernize 14-Story New York Office Building

OUTER EXECUTIVE OFFICES of Title Guarantee & Trust Co. at 176 Broadway, New York City, showing Typhoon H-166 SC unit. Overhead ductwork may be seen at top of picture. All units were installed on weekends and evenings to minimize distrubance to tenants.

NEW YORK CITY — When Cedar Management Corp. here sought to bring its property at 176 Broadway up to modern comfort standards, air conditioning was its first step.

### 90% SIGN UP

Since the building was 14 stories high, with each floor having 6,000 sq. ft. of floor space, the owners approached their tenants with the cost problem. Ninety per cent of the tenants signed up immediately, knowing that they were entering into an agreement that would raise their rental fees. One tenant, representing 10% which did not sign up for the modernization program, was leaving for larger quarters.

Billen Engineering Co., New York City, provided a cost plan, on a per square foot basis, for the consideration of each tenant and for the banks which expressed interest in financing this project. Actually, banks were anxious to enter into the financing of this project, which would be handled with five-year payment plans.

### PREFABRICATION CUTS TIME

The installation was made with little or no interruption of the office procedure of the tenants. Speed of installation was stepped up by prefabrication of all fresh-air intakes. The ductwork was made up for several floors at a time.

Billen Engineering calculated the heat load to require a total of 250 tons of cooling capacity. This tonnage was broken down between two lines of equipment: 150 tons consisted of General Electric FE-150 G's; the remaining equipment was made up of Typhoon H-166SC's. The Typhoon equipment was placed in the offices of one tenant, the Title Guarantee & Trust Co., which occupies 40% of the building.

The entire job was accomplished within a three-month period, with a minimum disturbance to occupants. All cutting, drilling, and sheet metal work was done on overtime at night and during weekends. The premises were clear and clean for the next business day.

### UNITS KEPT ON LINE

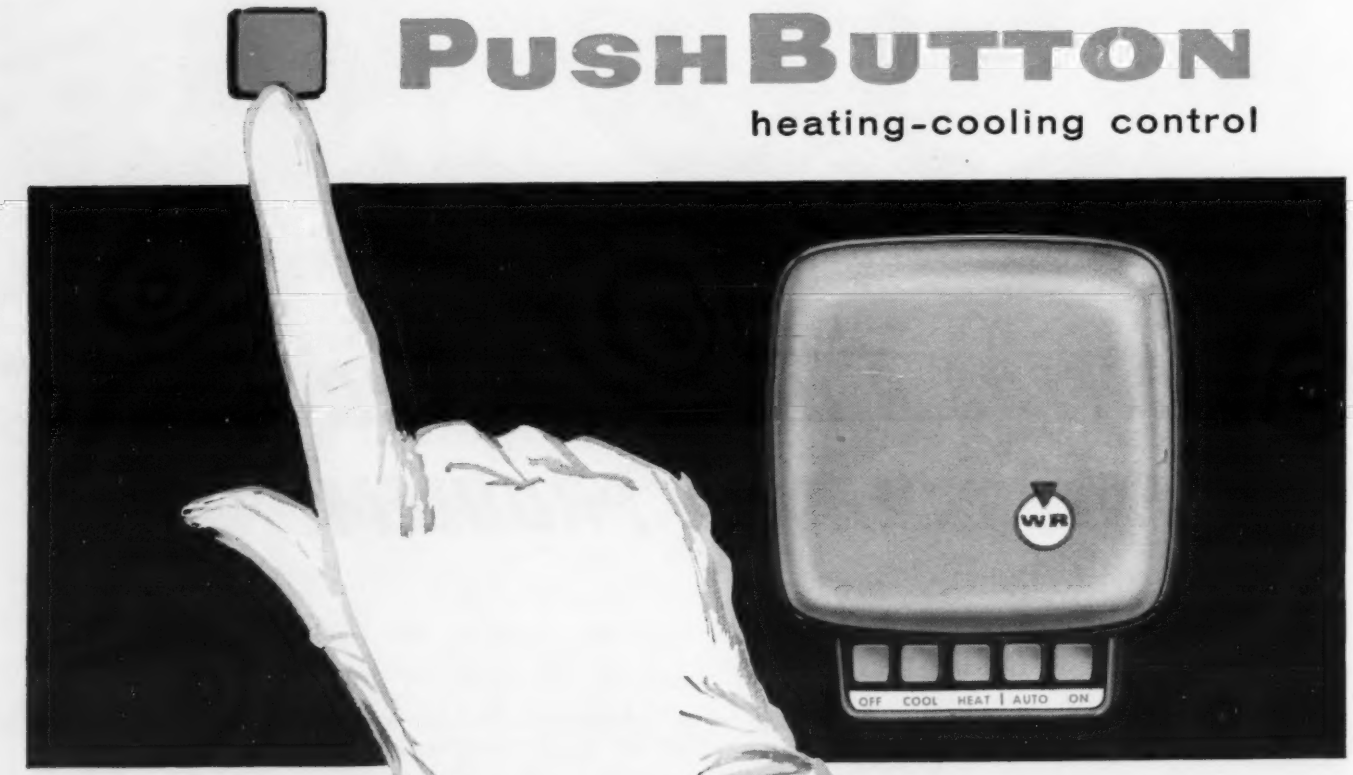
The design was set to keep units on line thereby cutting piping costs, electrical costs, and providing sheet metal similarity on all floors. The installation was handled on a floor by floor basis.

Of particular value to the building owners and the tenants was the fact that they received a package installation at a cost considerably less than that of a central station installation, it was reported.

Cedar Management did not air condition the remaining 10% of the building and they were not subject to charge on that portion of the job. At a future date the work may be done economically, because the engineering requirements have already been calculated.

Push buttons...your customers buy them everyday;
they're consumer accepted...and now you can have

PUSHBUTTON
heating-cooling control




to power *your* sales with WHITE-RODGERS

*Fashion Thermostat*

Automobiles . . . appliances . . . electronic brains,
everywhere you look, push buttons. Accepted . . . demanded;
in every field they've shot sales upward, and now
White-Rodgers combines the Fashion Thermostat with a
versatile new sub-base for PushButton heating-cooling control . . .
a brilliant new sales feature for heating-cooling equipment
in new homes . . . modernizations . . . replacements. Fits any
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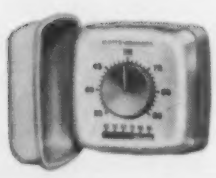

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Of course, sound, intelligent purchasing of reliable components is just one of the many ways we assure built-in dependability in every Bendix-Westinghouse compressor. We'd welcome the opportunity to tell you about all the others.

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**Automotive Air Brake Company**

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# *Workers' Fatigue Relieved by Air Conditioning, Preliminary Studies by du Pont Would Indicate*

*By C. Dale Mericle*

WASHINGTON, D. C. — Air conditioning can probably be justified on an economic basis in terms of relieving worker fatigue, it was indicated in a talk by Roger W. Fulling of the engineering department, E. I. du Pont de Nemours & Co., Inc., before the government-industry symposium held here under the joint sponsorship of the U. S. Department of Commerce and industry representatives.

Preliminary studies at du Pont's Haskell Laboratory for Toxicology and Industrial Medicine cited by Fulling tend to show benefits can be obtained even in "hot industries" if workers are given periodic rest periods in air conditioned areas. Spot cooling and even ventilated clothing should also be considered for some jobs, Fulling indicated.

"The largest investment of air conditioning in du Pont is for manufacturing areas, where relatively constant atmospheric conditions are required to provide continuity of production and uniformity of required product quality," Fulling said.

"Our general policy," he explained, "is to evaluate each problem and decide on the proper solution based on its own economics. There are no set rules or tabulations from which can be selected the recommended system. This is rather basic since in the chemical and textile fiber manufacturing industry, no two processes or even two plants making the same product will necessarily submit to the same solution at a given cost.

"In the case of office space, lunch rooms, conference rooms, and service areas, the pattern more or less follows precedence of installations in operation in our existing plants or in other plants in the vicinity," Fulling said.

"Air conditioning is often a competitive factor in the employment of office personnel and certainly contributes to improved conditions in cafeterias. We believe this pattern represents a problem as it confronts industry in general."

## Type of Work Important

First step in studying the effect of air conditioning on fatigue in workers, Fulling explained, is "to determine the type of work to be carried on in an area and establish the physiological rate of the people working in that area."

He cited estimates of human energy metabolism which ranged from 250 B.t.u./hr. for sleeping to 2,000-2,400 B.t.u./hr. for the hardest sustained work.

Next comes a detailed analysis of time studies and the work cycle to determine exactly what the worker is doing for how long a time, he said. From this is obtained an accurate picture of the workers' average metabolic rate in terms of B.t.u./hr.

For the particular work area under study, various methods of cooling (ventilation, evaporative cooling, or cooling with refrigeration) are plotted to show resultant "effective temperatures" and then the latter are charted against rate of metabolism.

"The maximum permissible 'effective temperature' versus metabolic rate line was proposed by Mosher of Eastman Kodak Co.," Fulling commented. "This curve is based on allowing a maximum rise in body temperature of 1½° F. after three hours' exposure of the subject at the given 'effective temperature.' It is to be realized that a greater 'effective temperature' can be tolerated for shorter periods. . . .

"In providing a reasonable safety factor for the 'effective temperature,' we design 2° below permissible maximum. . . . With this type of information before them, management is in a better position to decide which scheme to adopt," Fulling said.

## Radiant Heat Must Be Considered

In areas where hot surfaces add radiant heat to the problem, the factor of radiant heat and appropriate limits of human tolerance for it must also be considered, he pointed out.

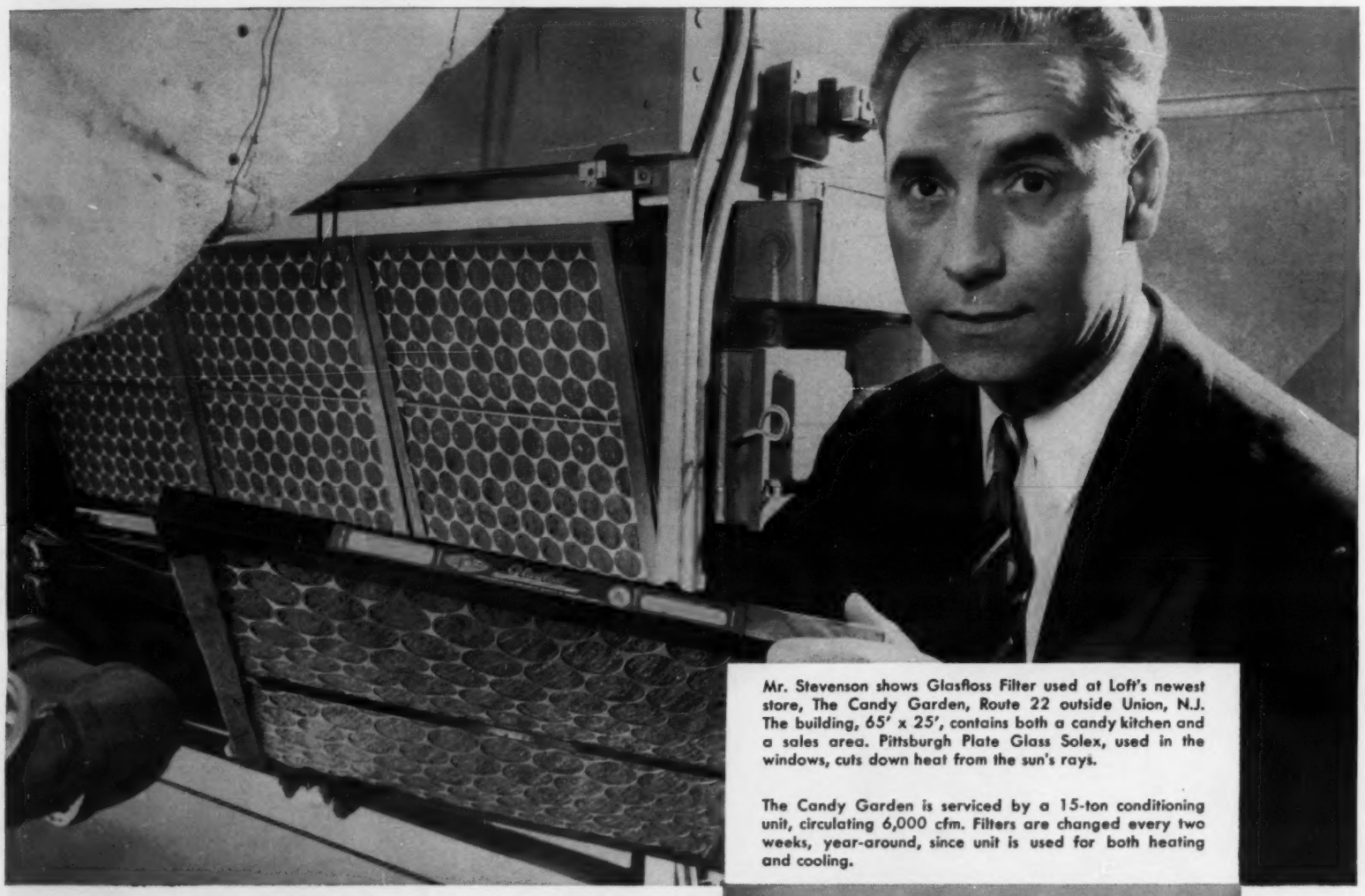
Du Pont's research at its Haskell Laboratory is being conducted by Dr. Lucien Brouha using two air conditioning test rooms.

One room is designed to maintain a dry-bulb temperature of 40° to 120° F. with relative humidity from 20% to 95%. The other will maintain a dry bulb from -10° to 200 F. with dewpoints from -10° to 110° F. Both rooms are arranged similar to a wind tunnel in that an air velocity up to 20 miles per hour can be maintained past the human subject of experiments.

An unusual device employed in the laboratory is a Lauru platform, which "is used to study task performance by sensing reactions on quartz crystals which in turn function similarly to a phonographic pick-up. Movement of the platform exerts pressure on six crystals, and the impulses are magnified and relayed to the recorder.

"With the use of these facilities, data are being developed which will contribute to the im-

*(Concluded on next page)*

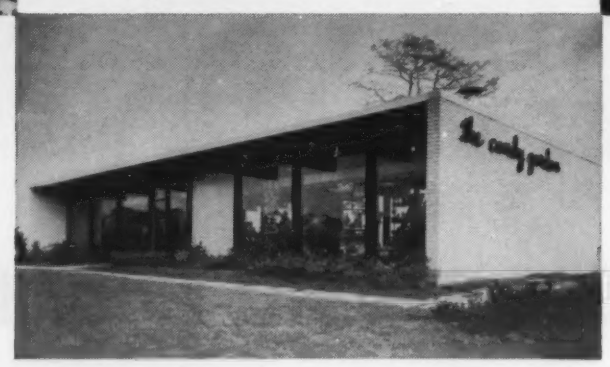



Mr. Stevenson shows Glasfloss Filter used at Loft's newest store, The Candy Garden, Route 22 outside Union, N.J. The building, 65' x 25', contains both a candy kitchen and a sales area. Pittsburgh Plate Glass Solex, used in the windows, cuts down heat from the sun's rays.

The Candy Garden is serviced by a 15-ton conditioning unit, circulating 6,000 cfm. Filters are changed every two weeks, year-around, since unit is used for both heating and cooling.

**"Glasfloss Air Filters cost us less to use . . . provide more efficient service"**

**reports Thomas Stevenson**
**Loft Candy Corporation's Director of Maintenance**



Air conditioning and cleanliness are paramount in the business of selling candy to the public. A constant temperature of 70 degrees year-around is needed to preserve the shape, taste and appearance of freshly made chocolates; candy shop interiors must always be spotless to attract and keep customers.

In Loft Candy Corporation's 225 stores, air conditioning maintenance and air filtering have been materially improved by using Glasfloss Air Filters. Short, brittle glass fibers no longer clog air conditioner condensate lines and drains. Elaborate maintenance procedures made permanent metal filters impractical for the firm's use.

"The Glasfloss Filters can be, and often are, changed by our sales girls," Mr. Stevenson explained. "They are also lightweight, easy to insert in the conditioning units, and long-lived because they filter in depth . . . that is, the dirt particles don't just encrust the surface. They are absorbed by the body of the filter."

There you have the important reasons why Glasfloss Air Filters are importantly different from conventional fiber glass or glass wool filters. Long, silky Glasfloss fibers are kind to the hands. Glasfloss offers less air resistance, holds more dust and dirt, doesn't surface load. In daily operations, these features mean dollars and cents saved in your office, store, plant or building. For more information, write Glasfloss Dept., Fiber Glass Division, Pittsburgh Plate Glass Co., One Gateway Center, Pittsburgh 22, Pa. Ask for a copy of Bulletin DF3.

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# Cooling Benefits Workers--

*(Concluded from preceding page)*

provement of working environment and reduction of fatigue for a given job," asserted Fulling.

"One interesting study was the confirmation of average body temperature variations during an 8-hour shift with and without air conditioned rest rooms," he said. There was "a definite improvement in average body temperature variation with air conditioned rest rooms.

### Employe Health Factor May Be Bonus Value

"One of the widely believed ideas about air conditioning is that our bodies suffer if we go back and forth between cool areas and much warmer ones," Fulling also said. "Dr. Brouha's studies effectively discount this belief. In fact, advantages in terms of employes' health and morale may well become a big plus value of air conditioning with refrigeration."

When the worker is subjected to heat stress, Fulling also indicated, "the environmental engineer must be able to answer two questions:

"1. For a given job, what is the maximum thermal environment that is physiologically permissible? Consideration must be given to temperature, humidity, radiation, and wind velocity.

"2. For jobs where the rate of production is not fixed by mechanical limitations, how is the maximum allowable work-rest pattern, as determined by physiological criteria, affected by the thermal environment?

### Heat Stress Studies

"Du Pont has an experiment under way to study the fundamentals of heat stress as a first step in providing a quantitative method of answering these questions. Further experiments will be required in which more variables are considered, and the assumptions of the current experiment are tested and revised if necessary. The results of heat stress investigations must be put into a form suitable for engineering use," Fulling said.

"Work load problems are the specialty of methods and standards engineers and heat load problems the concern of environmental engineers. The medical and personnel departments are responsible for the proper selection of workers. The successful solution of the heat stress problems requires cooperative work by engineering personnel and medical specialists.

"The benefits we expect to derive from a thorough study of the heat stress problem are:

"1. The health and safety protection of workers will be improved by defining the limits of excessive heat exposure.

"2. Major cost reductions should result from having the means with which to evaluate the economics of alternative solutions to heat stress problems.

"3. Improved employe relations will be fostered by establishing rest allowance on a more tangible and consistent basis.

"Industry must constantly keep abreast of new technical knowledge and be ever watchful of total costs. Studies are made covering various types of building construction and their effect on the required capacity of air conditioning systems. Total cost of the combined facilities are compared and studied for the indicated cost of the economic plant.

"It has been found that, with a constant transmission factor for a building shell, the cost of the required air conditioning system is not affected by the increased cost of a more elaborate structure," Fulling asserted.

"With a constant transmission factor for the shell of the building, the capacity of the required air conditioning system is dictated by the sum of the internal load and the ventilating outside air loads. The omission of windows in outside walls may reduce the cost of the required air conditioning system as much as 5% and the cost of the wall may be reduced as much as 30%.

"To obtain the lowest cost air conditioning system, it is obvious that the complete facility should be installed along with the construction of the original building.

"If the air conditioning system is not to be installed until later, all necessary planning for design and construction should be made toward ease and reduced cost of later installation. Even with the most detailed planning for later installation, the combined cost will be higher. If provisions are not made, the final cost will be still higher.

"Taking a base of 100% as the cost of the air conditioning system installed along with the building construction, the two-part job, that is with careful provision made for the future installation, could cost in the range of 110% to 125%. The installation of a similar system in a building where no thought nor provision had been made for the installation, could cost in the range of 130% to 150% or even higher," Fulling declared.

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# Electric Service for Residential Systems

## *A Discussion of: Service Voltage, Unbalance In 3-Phase Voltage, Need To Protect Against 'Single-Phasing' of 3-Phase Unit*

*By Albert S. Anderson, Ebasco Services, Inc.*

Albert S. Anderson is an electrical engineer on the staff of Ebasco Services, Inc., well-known firm of engineers, constructors, and business consultants, serving primarily electric power companies.

Among the many problems which he has looked into is that of electric service for year-round central residential air conditioning systems. He was a participant in the forum on "Electrical Requirements and Problems of Air Conditioning Equipment" at the recent annual ASRE convention, following which the NEWS asked him to prepare a discussion of some of the major factors involved in electric service for residential systems.

The accompanying article covers this subject.

In consideraing the long-range aspects of residential air conditioning, it appears as though new homes will generally be built with central units where the air will be heated, cooled, filtered, humidified, or dehumidified and ionized.

Instead of the largest motor in the home being fractional in hp. rating as now, the largest motor will be 2, 3 hp. or even 5 hp. in the larger homes.

Three-phase units as well as single-phase units will be used extensively. The choice will depend upon which type of service the utility company will make available from its street mains.

For single and two-family residences in suburban areas, the trend will be to use single-phase units instead of three-phase units because of their more favorable over-all costs including utility system, customer's wiring and equipment.

### PURPOSE OF ARTICLE

The purpose of this article is to discuss certain aspects of three-phase service that should be universally understood especially in the air conditioning industry.

Three items will be discussed:

(a) service voltage;

(b) unbalance in three-phase voltage;

(c) the need to protect against "single-phasing" of a three-phase unit.

### SERVICE VOLTAGE

In any area, the utility company will freely furnish information regarding the voltage rating and voltage limits of its service. The voltage rating of a three-phase service is directly related to the specified rated lamp voltage that the utility recommends for use on its system. These generally are 110 volts, 115 volts, 120 volts, or 125 volts.

The 120-volt rated systems are in most general use and the available three-phase voltages for this rating are listed in Table I in terms of the type of secondary three-phase system, voltage rating, and minimum and maximum tolerable voltages.

### UNBALANCE IN THREE-PHASE VOLTAGE

It is a generally accepted fact in the electric industry that a utility company cannot always supply the exact rated voltage and frequency for a utilization device. Considerable tolerance in voltage does not adversely affect performance of a suitably designed motor and is economically beneficial to the whole industry. As a consequence the minimum and maximum tolerable voltages are coming to be generally used in the air conditioning industry.

However, no tolerance in unbalance voltage seems acceptable to manufacturers and contractors. The evidence of slightest unbalance in voltage at the service switch is a signal for many to seek system betterment of the utility system. Five years ago NEMA sent out a release which read:

"To avoid possible damage to the motor or depreciation in the operating characteristics, the supplier of power should be notified of such unbalance in order that the situation can be corrected.

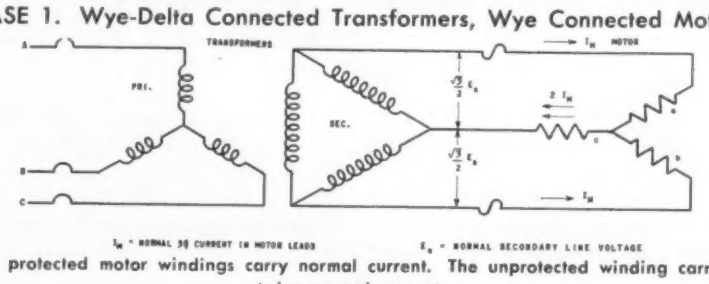
"The voltages should be evenly balanced as closely as can be read on the usually available commercial voltmeter."

*(Concluded on next page)*

**TABLE I**

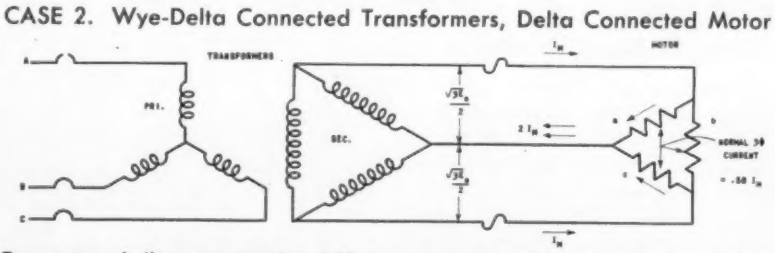
| System | Rated Nominal Volts | Tolerable 3-Phase Voltage Minimum | Maximum |
|---|---|---|---|
| 4-wire Delta for 1 and 3 phase | 120/240 | 216 | 254 |
| 4-wire Wye for 1 and 3 phase | 120/208 | 193 | 220 |
| 3-wire Delta for 3 phase only | 120/240 | 216 | 260 |

CASE 1. Wye-Delta Connected Transformers, Wye Connected Motor




The protected motor windings carry normal current. The unprotected winding carries twice normal current.

CASE 2. Wye-Delta Connected Transformers, Delta Connected Motor




Two motor windings are carrying 1.73 times normal current and protective devices carry only normal current.

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Extremely low moisture content! Exceptionally high purity!




*For more information about products advertised on this page use Information Center, page 22.*

# Electric Service--

*(Concluded from preceding page)*

To the writer's knowledge this release still stands as the NEMA procedure to be taken in the case of an unbalanced voltage situation. Today with the great increase in the use of three-phase motors for air conditioning, the matter of supplying nearly perfectly balanced three-phase voltage becomes a problem of considerable economic consequence to the utility.

It is fully realized that an unbalance of 10% will cause a circulating current in the motor of approximately 70% of its rated current which when added to the load current would cause an intolerable condition. Such an unbalance should not exist.

On the other hand, it is seldom realized that the cost to the utility to correct a slight unbalance of 2% or less may be a substantial amount. In those cases of motor trouble where such slight unbalance exists, it will usually be much less costly to reduce or eliminate the other contributing factors than to insist on a perfectly balanced voltage.

A reasonably small allowance in the order of 2% for unbalance in voltage is of great economic importance to the utility.

In the practical application of motors the manufacturer provides a cushion to allow for deviations from design conditions. This cushion is know as the service factor. A reasonable allocation of part of this service factor for an unbalanced voltage condition is recommended.

If the number of applications of three-phase motors to residential air conditioning installations continues to increase at the present rate, the economic significance of this recommendation will become increasingly important.

So in answer to the NEMA release of a few years ago let it be said "ALLOW FOR A VOLTAGE UNBALANCE OF A REASONABLE AMOUNT." Let the industry get together and define the reasonable amount.

### 'SINGLE PHASING'

A three-phase motor that is running can continue to run when one phase of the three-phase service is interrupted. If this interruption is caused by an open conductor on the motor side of the supply transformer, the motor is protected even if the protecting element is in only two of the three lines or leads to the motor.

However, if the open circuit occurs on the primary lines to the supply transformer such may not be the case. This depends on the transformer connection.

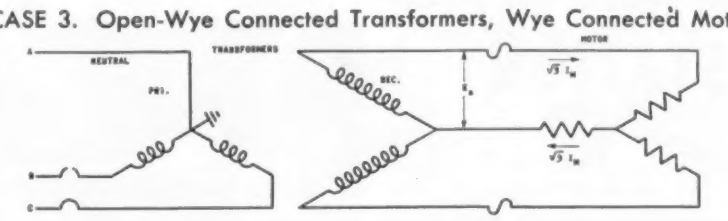
The accompanying diagrams show the single-phase current flow for various transformer connections and for wye or delta-connected motors.

These diagrams show current values based on the assumption that motor speed remains the same and that the value of secondary voltage Es does not change because of the single-phasing action.

It is obvious from these diagrams that all three lines or leads to a three-phase motor should be protected. The third element should be provided in the factory or in the field.

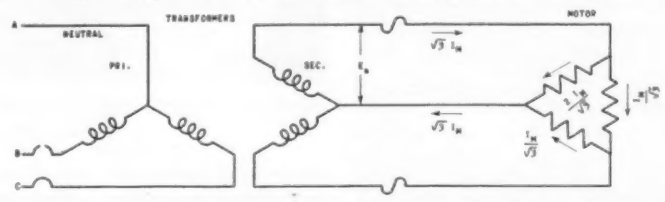
In cases where protection is provided in the field, a time delay fuse should prove satisfactory. The cost of course is small compared to the total installation cost.

CASE 3. Open-Wye Connected Transformers, Wye Connected Motor



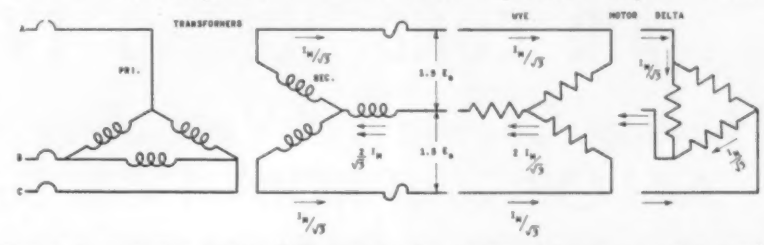

Current in protective device and motor winding 1.73 times normal.

CASE 4. Open-Wye Connected Transformers, Delta Connected Motor



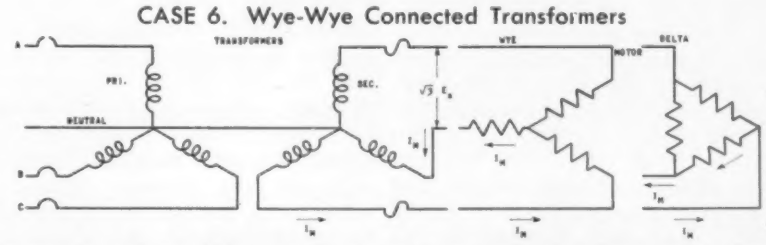

Current in one winding twice normal and 1.73 times normal in protective device.

CASE 5. Delta-Wye Connected Transformers, Motors Wye or Delta




Current in protective devices 0.58 normal. One winding of wye connected motor carries 1.15 times normal. No windings of delta connected motor overloaded.

CASE 6. Wye-Wye Connected Transformers




Current in protective devices normal. Current in wye connected motor normal. Current in one winding of delta connected motor normal.

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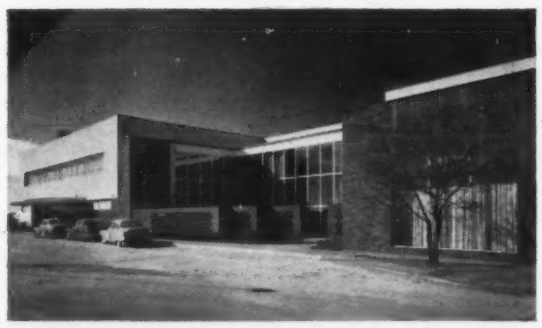

*For Stores and Public Buildings of the Air Conditioned Age!*

*For Factories of the Air Conditioned Age!*

**genetron 11** ORANGE LABEL

**TRICHLOROMONOFLUOROMETHANE**

*Quality Specifications*

| | |
|---|---|
| Moisture wt. %, max. | 0.0010 |
| Chlorides | none |
| High boiling impurities—vol. %, max. | 0.01 |
| Boiling pt. at 760 mm. Hg °F. | 74.7 |
| Boiling range °F (to 85% pt.), max. | 0.5 |

**USES**

Trichloromonofluoromethane ("Genetron" 11) finds widespread use as a refrigerant in industrial and commercial air conditioning systems using single or multi-stage centrifugal compressors. It can also be used for either direct or indirect expansion-type systems.

**genetron 12** WHITE LABEL

**DICHLORODIFLUOROMETHANE**

*Quality Specifications*

| | |
|---|---|
| Moisture wt. %, max. | 0.0010 |
| Chlorides | none |
| High boiling impurities—vol. %, max. | 0.01 |
| Non-condensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max. | 1.5 |
| Boiling pt. at 760 mm. Hg °F. | −21.6 |
| Boiling range °F (to 85% pt.), max. | 0.5 |

**USES**

Dichlorodifluoromethane ("Genetron" 12) and Monochlorodifluoromethane ("Genetron" 22) are the most widely used organic fluorine refrigerants. They are used in virtually all types of air conditioning equipment, large and small, household and industrial, direct and indirect expansion systems.

**genetron 22** GREEN LABEL

**MONOCHLORODIFLUOROMETHANE**

*Quality Specifications*

| | |
|---|---|
| Moisture wt. %, max. | 0.0010 |
| Chlorides | none |
| High boiling impurities—vol. %, max. | 0.01 |
| Non-condensable gases (gases insoluble in perchloroethylene)—vol. % in vapor phase, max. | 1.5 |
| Boiling pt. at 760 mm. Hg °F. | −41.4 |
| Boiling range °F (to 85% pt.), max. | 0.5 |

Some of the typical units in which "Genetron" 12 and 22 are used: window air conditioners, home or office console units, large store units, large custom-built units for commercial comfort, large home units for addition to present hot air heating systems, and mobile units for transportation equipment.

**genetron 113** PURPLE LABEL

**TRICHLOROTRIFLUOROETHANE**

*Quality Specifications*

| | |
|---|---|
| Moisture wt. %, max. | 0.0025 |
| Chlorides | none |
| Boiling pt. at 760 mm. Hg °F. | 117.6 |
| Boiling range °F (to 85% pt.), max. | 1.8 |

**USES**

Trichlorotrifluoroethane ("Genetron" 113) is used in 50-ton and larger centrifugal compressors, primarily for large comfort cooling systems, brine cooling systems, and other commercial and industrial air conditioning systems.

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*genetron department*

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# AIR CONDITIONING TV STATION

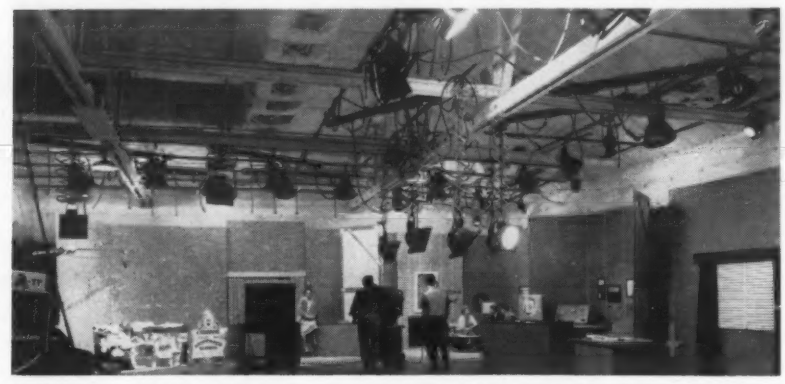
## Heating, Cooling and Ventilating Studio, Transmitter And Offices of KCRA-TV In Sacramento, Calif.

*By Leonard D'Ooge, Air Conditioning Engineer (Registered Professional Mechanical Engineer, State of California)*

The new Sacramento, Calif. radio and TV station KCRA beams its programs to the Sacramento Valley communities from Chico on the north, to Modesto on the south, between the Sierra and coast ranges. The TV studio is housed in a 160 by 80-ft. one-story building in the heart of the city, in a heavy industrial district. On the north side of the building, a 48 by 80-ft. two-story wing accommodates the KCRA radio studio, administrative offices, and control room.

Air conditioning the studio building for comfort was of course a prime consideration, but because of the numerous varying temperatures produced by the wide range of activities concerned, one central system was not the answer. Climate control by zoning the different areas throughout the building had to be carefully planned, not only for cooling but for heating as well.

In the one-story TV wing a "central plant" system to heat and cool the 40 by 80-ft. studio room was worked out comprised of a Worthington 25-hp. compressor and an attic mounted air-handling unit with hot water coil. A Worthington 10-ton packaged unit with hot water coil was also installed in the equipment room to cool the control room as well as the shops and offices flanking the control room.



BLANKETED SUPPLY DUCT runs full length of KCRA-TV studio above light grids keeping room free from outside noises.

### Control Room Needs No Heating System

No heating system is required in the control room where the equipment radiates a high heat output, but year-round cooling is a necessity. For this reason, the hot water coil is located over one unit only on the side supplying the shops and offices and together with the heat drawn from the transmitter room, it takes care of the winter indoor climate requirements. Each of these zones has its own separate room thermostat control.

The Administrative, Accounting, Sales, and Publicity Departments, situated in the front one-third of the building, on the east side of a fire-wall, are air conditioned all year around by a Worthington 10-ton packaged unit with hot water coil.

### TV Wing Units Have Remote Air-Cooled Condensers

All Worthington units installed in the TV wing operate on remote air-cooled condensers cycling on pressure control.

The first floor of the two story radio station wing, wherein are located the offices and studio, control room and record room, is climate controlled by two Worthington "Flexi-Cool" units which have been installed back-to-back and discharge into a common plenum.

Within the plenum a hot water coil has been mounted in a horizontal position 18 in. above the discharge opening to handle two zones—the offices on one side and the studio, control room, and record room, on the other.

Since the control room zone needs less heating than the other, a by-pass duct take-off has been installed under the heating coil of number one Flexi-Cool unit to supply 80% ventilation and outside air to this zone when the other area calls for heating.

Another Worthington Flexi-Cool unit with hot water coil, situated on the second floor presently unused except for occasional meetings, discharges directly into an assembly room over the entire area. Its function is merely to temper the normal sun-effect heat-gain of a top-floor room and thus help the first floor plant to operate more efficiently.

### First Floor Units Help Cool Second Floor When Used

When a meeting on the second floor is scheduled, the first floor equipment is put to work through duct and damper arrangements to give, with the top floor unit, a combined 15-ton cooling effect. When the top floor is subdivided into offices, it is planned to add another Flexi-Cool unit and the required ductwork for proper air distribution.

All three Flexi-Cool units in the radio station wing are circuited individually to one remote air-cooled condenser on the roof.

The designing of a zoned system to give complete year-round air conditioning presented several problems much different than usually encountered in the usual commercial or industrial application.

In addition to the customary need for keeping air movement and equipment noise down to

*(Continued on next page)*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Use RIMSET and PENN controls for all cooling and heating jobs as well as for commercial refrigeration ... a few controls from the complete line are shown, there are many more. Investigate Penn Controls ... they "stay on the job" longer!

PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

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*For more information about products advertised on this page use Information Center, page 22.*

# Air Conditioning TV Station--

*(Continued from preceding page)*

the lowest possible level in the control room and studio, the fact that the building is next to a large freight handling yard called for complete acoustical insulation and sound-traps on all ducts and ventilation and exhaust openings to the outside air, plus a thorough cleaning job on every cubic foot of cooling and ventilation air admitted to all areas containing high-voltage electronic equipment.

The first step taken was to "remote" the four high-speed, high-pressure blowers from the customary location in the bases of the TV transmitters to the outside of the building. They were rubber-mounted on steel plates in pairs over the openings of buried concrete ducts connected to the base of each unit.

### Electrostatic Filters

The intake air to the plenums built around each pair of blowers is drawn through electrostatic filters. This move accomplished three things.

1. Their high-pitched noise was taken from the transmitter room which adjoins the control room;
2. Full advantage was taken of the cooling effect gained by passing the air through 28 to 36 ft. of buried ducts at ground temperatures;
3. The maintenance-cleaning of the transmitters was reduced to infrequent minor dusting operations, even though the station is located in a dusty area.

### Eliminating Equipment, And Air Noise

To eliminate, as far as possible, all equipment and air noise to meet exacting control room and studio requirements, the exhaust duct from the top of the studio to the outside received a one-inch acoustical lining as far as the outer wall. The supply duct between the blower and the studio wall and the first 20 ft. of the return-air duct were treated the same way.

Both ducts also received a wrapping of 2-in. blanket insulation in the attic to guard against outside noises coming through the roof. The section of exposed supply-duct running the full length of the studio above the light grids was also given a 2-in. wrapping for thermal protection. (See photo).

Conditioned air for the Control Room first passes through an electro-static air-cleaner then an "Aircoustat" sound trap and is distributed through "Multi-Vent" panels. All these ducts received a 2-in. blanket insulation for thermal as well as outside noise protection.

### Exhaust Stack Helps Reduce Cooling Load

To help reduce the cooling load for this room a special exhaust-stack extends from the ceiling to an exhauster on the roof which draws off much of the heat generated here. An Aircoustat on this duct keeps out all outside noises. It is not insulated. Another Aircoustat on the equalized duct connecting the Control Room with the Announcers' Room also effectively keeps out all sound from this area.

The Equipment Room for the front office area on the east side of the fire-wall serves as a return air plenum for that zone. Here all supply and return air ducts received a thermal insulation blanket and the two return-air openings from the general offices and the Audition Room to this plenum were acoustically treated with a 1-in. insulation lining to attenuate all equipment noise which might otherwise be heard in the offices immediately adjoining.

The Multi-Vent diffusers referred to above keep air supply outlet noise to a minimum. Although 10 to 15 air changes are being handled through them, outlet velocities are all under 200 f.p.m. and air movement is inaudible.

To reduce equipment vibration noise a soft-spring vibration-absorbing mount was used where ever necessary. This mount together with flexible connectors completely isolates all vibration of compressors, fans, and motors from the building.

Springs for this special mount are so soft and flexible they can be individually compressed by hand yet assembled in multiples proportionate to the weight to be handled, they literally float

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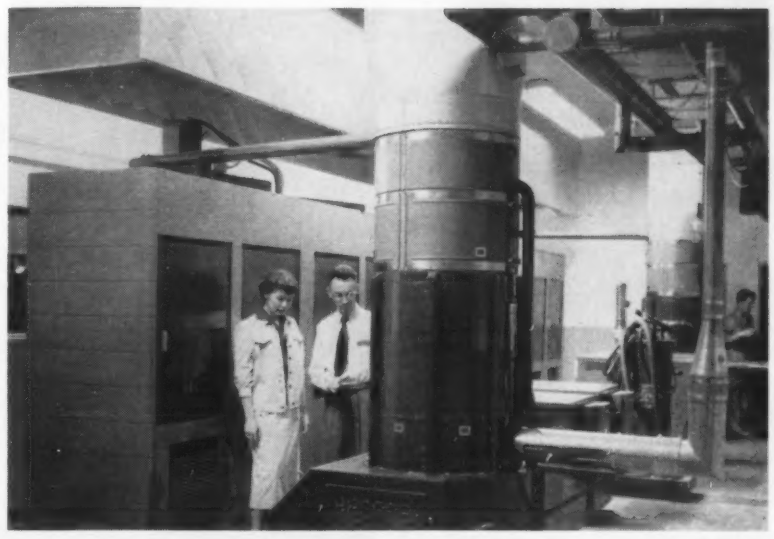

MAIN EQUIPMENT ROOM OF STATION KCRA. Station manager describes operation of equipment to technician.

TWO WORTHINGTON FLEXICOOL units with common discharge plenum mounted back to back with a hot water heating coil shown in duct.

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# TV Station Air Conditioning--

*(Concluded from preceding page)*

the equipment the same as is done in domestic room conditioners and refrigerators.

There was also the opportunity to work out some way in which the heat generated by the high KW input to the transmitter would be effectively dissipated during warm weather to keep operating temperatures well below the critical point and then to make full use of the B.t.u. output of this equipment during cold weather for heating purposes. According to the Engineering Products Div. of RCA, manufacturer of this equipment, only three other TV stations had succeeded in doing this at that time.

As the scheduled called for the station to be on the air by Sept. 1, when some of the highest temperatures of the year could be expected, early provision was made to keep down the transmitter room ambient temperatures, and also to get rid of the direct air-cooled equipment heat as fast as generated.

Two large openings in the outer wall protected by filters gave an ample source of outside ventilation air to the transmitter room itself. This is drawn through the room over the cabinets, cubicles, and electronic bank assemblies then up through ceiling outlets provided, into the attic, and out through the roof. A 10,000 c.f.m. exhauster handles this air.

This gives a 4-minute air-change to the room plus carrying away the input of cooling air to the equipment from the remote blowers. It also helps to remove the sun-effect heat load from the attic. Some 108° weather in September proved its effectiveness.

WORTHINGTON 20-TON COMPRESSOR installed at station KCRA.

Before the late fall and winter months called for the need for heating, hot-air collector-hoods and direct duct-connectors were installed above all transmitter equipment. In the attic overhead, a duct manifold taps these outlets and the heated air is drawn off through an insulated duct to the return air suction side of the air conditioners for the studio and the operating area.

This heated fresh air is distributed by them to their respective zones. As this is all outside air, filtered and heated by transmitter equipment, it was felt that nothing would be gained by recirculation in the conditioned area. So the return air duct dampers of the system are closed and automatic gravity ceiling louvers provided in all zones vent to the attic to equalize and yet maintain a mild positive pressure at all times.

### Roof Exhauster Shut Down During Cold Weather

The roof exhauster is shut down during cold weather, and in the mornings and evenings in the in-between seasons of spring and fall, when both heat- and cooling may be called for in any given 24-hour period.

Enough cold weather close to the local "design" temperature of 30° F. has been experienced to show that the studio and work-area zones can be kept at a comfortable level with transmitter heat most of the time.

As a supplemental heat-source when additional heating might be needed or at any time before the station goes on the air, the hot water coils in each of the air conditioning units are supplied by a thermostatically controlled pump from a 250-gal. storage tank and a special design central-plant bank of immersion type Calrod water heaters, to be described later.

The cooling of the building is handled much of the time by 100% outside air. In this part of the country, even though it may be as much as 110° F. from 2 p.m. to sundown, there is always a 40° to 50° temperature drop during the night. In fact, the outside air is usually well under 79° F. as late as 8:30 to 10 a.m. the next morning.

Full advantage is taken of this fact by oversize air inlets and thermostatically controlled dampers which are open all night long and remain open as long as the air is below 80° F. During the night, all accumulated and stored heat is drawn out of the building and the temperature of the whole structure and contents starts the next day within ten degrees of the low of the night before. The flywheel effect carry-over is such as to maintain a comfortable condition well into the afternoon without additional cooling, except for the Control Room. The electrical input to the Control Room is such that refrigerated cooling is usually called for all of the time. This is also the case when live shows are started in the studio in the morning.

### Dampers Close When Outside Temperature Reaches 80%

When the outside air passes 80° F. these dampers close, to a 20% minimum, the return-air dampers open and the compressor with remote coil for the studio and 10-ton packaged conditioner for the control room, shops, and office area handles the load in the usual manner aided by ceiling heat exhausts from both areas.

Because of the fact that the refrigerated cooling equipment has only to maintain an already established comfort condition created by the use of outside air rather than having to overcome an accumulated heat-load, it is estimated that at least 30% power saving is realized.

The front part of the building, all on the other side of a fire wall, contains the executive and general offices and is about one third of the total 11,500 sq. ft. building area. As this zone is completely separated from the rest of the building none of the transmitted heat is available to it. It draws upon the central hot-water heat source referred to above and is cooled by outside air supplemented by a Worthington 10-ton packaged conditioner in the same sequence as described for the other zones.

### Central Heating Plant

The central heating plant is of interest due to the fact that the total available input is less than 179,000 B.t.u./hr. Considered in the line of this being the only "heating dollars" spent for the whole building, the savings realized by the use of waste heat from the transmitter are obvious.

The heating plant is made up of a bank of ten 5KW immersion type heaters and a 10-step mercury switch step-controller; a 250-gal. storage tank and a circulating pump. The 40-gal. electric domestic hot water heater for washrooms and showers is also connected to the storage tank by a gravity system independent from the circulated system. It maintains the storage tank at 150° F.

A thermostatically controlled motorized valve on the inlet to the coil for each zone controls the flow of hot water to that coil.

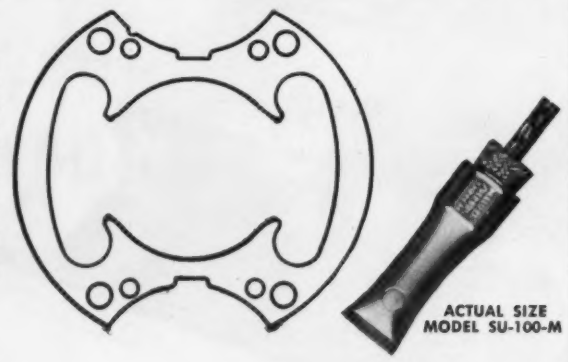
When any one zone calls for heat the valve opens and hot water is immediately available from the tank. As the temperature of the stored water is lowered an aquastat closes to start the 10-step controller which puts the Calrod heaters "on the line" as needed.

In actual operation, all 10 contacts are usually made at the start, then as the heating requirements are met the controller backs down.

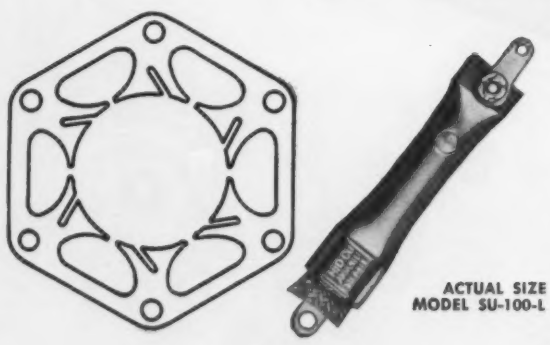
It was observed that on chilly mornings at the start of fall weather, the stored water was practically all that was needed to temper the air. A high-limit switch protects this system in case of water or motor failure.


MIGHTY MITE PROTECTS MOTORS AGAINST FAILURE REGARDLESS OF *Lamination Shape*

Mighty Mite motor protectors can be furnished as small as ¾" long x 5/16" wide for motors rated up to ½ h.p., 115/230 volts. Millions of Mighty Mites used in leading makes of electric motors have proved dependable performance.

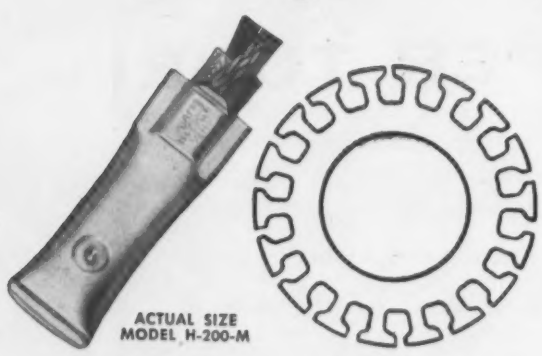


ACTUAL SIZE MODEL SU-100-M



ACTUAL SIZE MODEL SU-100-L

Mighty Mite protectors add years of service life to any motor by continuously and automatically eliminating over-heating and charring of insulation, as well as possible burn-out. Mighty Mites are tamper-proof and cannot change their factory-set operating characteristics.



ACTUAL SIZE MODEL H-200-M

Mighty Mite units are accurately pre-calibrated at the required break temperature up to 200°C. They are supplied in special "ready-to-use" packages, and require no further sorting, adjusting or other handling prior to actual installation on the motor assembly line.

Mighty Mite thermal protectors can be conveniently fitted into practically any stator design. In operation, they will automatically break the circuit to the stator field whenever the motor exceeds a predetermined safe operating temperature. When the temperature returns to normal, the Mighty Mite will automatically reconnect the circuit.

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*For more information about products advertised on this page use Information Center, page 22.*

# SOME UP . . . .

## . . . . . some down

## Financial Reports of 13 Firms Indicate

DETROIT — New first-half record sales and net profits were announced recently by **The Trane Co.**

Increased sales and/or earnings for the second quarter and first half of 1957 were reported by other industry firms, though some were not up to last year.

For the first half of this year, Trane reported consolidated sales of $39,762,334, an 8% increase over 1956 figures of $36,849,887. Net profit was up moderately at $2,640,883 for 1957 as compared with $2,573,872 for the same period in 1956.

For the three months ending June 30, consolidated sales were $21,131,131 with net profit $1,470,410, both highs. The 1956 quarter sales were $19,229,951 and net $1,424,250.

Net earnings per share for the second quarter this year were 69 cents and for the first six months $1.24, based on 2,129,846 shares of common stock outstanding.

This includes the 150,000 shares offered June 6, the entire issue of which was oversubscribed and books closed in less than one day.

The sale of this stock is reflected in the substantial jump in total current assets of $37,059,117 for 1957 as compared with $29,654,996 in 1956, and in working capital which is up to $29,226,901 for this year as against $22,415,717 last year.

The proceeds of this sale will, in part, be used by Trane for capital expenditures.

Major construction projects scheduled for late 1957 and early 1958 include a new plant at Clarksville, Tenn., for the manufacture of central-type residential air conditioners, a plant in La Crosse to produce brazed aluminum heat exchangers, doubling of the firm's research and testing center here, and expansion of the company's plant in Scranton, Pa.

Here is how some other companies sized up their operations in recent reports.

**Dunham-Bush** sales for the quarter ending June 30 were $8,678,000, a decrease of 17% compared to the same period last year, Cecil Boling, president reported. Net earnings for the quarter were $265,000, amounting to 23 cents per common share after preferred dividends.

Net results from sales of cooling products were not as good as had been anticipated, Boling said. Sales of heating products, however, had held up quite satisfactorily.

Results of the Brunner Div. and the Brunner Co. are included in the report.

**Hussmann Refrigerator Co.** reported that orders and shipments of food store equipment during the first half of the year were "somewhat below those of the corresponding period of 1956.

"While the volume of equipment purchased by the large chain stores showed an increase over last year, the effect of a decrease in residential construction together with a greater difficulty in obtaining construction funds and the higher cost of such money, has held up a large number of pending programs."

Consolidated sales for the first six months were $15,523,461, an increase of 3.35% over the same period of 1956. Consolidated net earnings were $1,151,780 compared with $1,209,595 last year.

The Hussmann report noted that the company has set up the Hussmann Acceptance Co. as a wholly-owned subsidiary, to handle its finance business. It has turned over its instalment receivables to the company.

**Ranco Inc.** reported net sales of $6,209,997 during the second quarter of 1957 compared with $6,343,583 in the same quarter last year. Net profit was $543,450 as compared with $489,072 last year.

"Increased shipments of air conditioning and automotive controls and more than 60% gain in sales by a British subsidiary enabled Ranco to do a greater aggregate business in the nine months ended June 30 than a year ago, A. M. Hoover, president, reported.

**Minneapolis-Honeywell Regulator Co.** reported sales of $81,820,884 for the second quarter, up from $66,676,375 in the same period of 1956. Net income, however, was only $5,049,351 as compared with $5,024,250 last year.

**Cutler-Hammer, Inc.,** in the six months ended June 30, had sales of $38,874,281 as against $40,174,750 last year. After taxes, net income was $3,099,539 as against $3,743,391 in the first half of 1956.

**Square D Co.** reported record sales of $50,696,210 for the six months compared with $48,446,620 for the like period last year. Net income, however, was $4,464,656 as against $5,218,096.

**Rheem Mfg. Co.** earnings rose sharply during both the second quarter and first half, reported A. Lightfoot Walker, president, reflecting the "substantial improvement that has been accomplished in the company's operating and financial position."

Net income for the second quarter rose to $861,843 from $227,238 last year. For the six months, net income was $1,473,307, up from $1,126,959 last year. Sales for the half year jumped to $101,234,709 from $82,965,953 in the like 1956 period.

**Worthington Corp.** announced a net income of $4,868,268 for the first half of 1957 as compared with $4,529,719 last year.

**Philco Corp.** showed a "modest profit" of $506,000 during the second quarter as compared to a $686,000 loss in the same period last year. Sales for the quarter were up to $83,388,000 from $74,386,000.

**American Radiator & Standard Sanitary Corp.'s** earnings in the second quarter dropped to $2,272,440 from $5,688,587 in the 1956 period. Net sales of $183,250,138 compared with $194,998,467 last year.

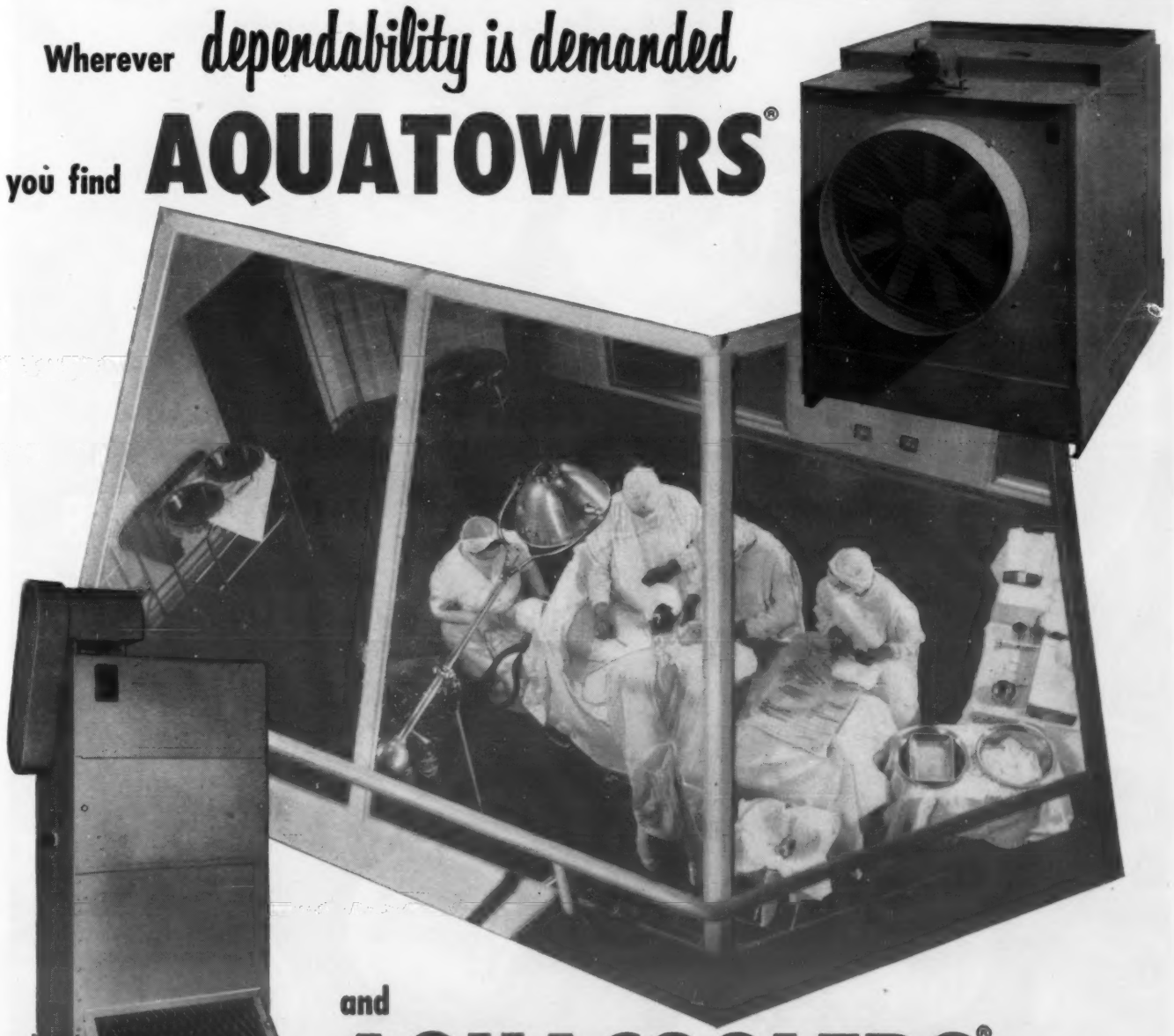
"Earnings continue to be adversely affected by the prevalent cost-price squeeze on profits," declared Joseph A. Grazier, president.

**Stewart-Warner Corp.** reported the highest net income for the second quarter in 28 years, with an increase of 6% over last year. The firm earned $3,373,809 on sales of $60,903,908 during that period as compared with $3,178,028 on $57,830,083, last year.

**Owens-Corning Fiberglas Corp.** reported sales for the first half rising to $85,887,506 from $82,144,702 in 1956. Net income, on the other hand, toppled to $4,895,547 from $5,698,093.


Wherever **dependability is demanded**

you find **AQUATOWERS®**



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In hospitals, clinics and other super-critical installations, Marley Aquatowers and AquaCoolers are and always have been first choice. Engineers who specify and contractors who install these jobs have complete confidence in Marley performance because Marley towers have up to 25% more long-life nailless wood filling and exclusive diffusion decks for best water break-up; and they have the engineered aero-dynamic capacity to make the added filling effective.

Marley designs and manufactures mechanical equipment that is specifically engineered for cooling towers—guaranteed to deliver uninterrupted service so vital to these installations, and do it with minimum, non-professonal maintenance.

Today every cooling job is "critical"—at least, so far as the contractor's professional reputation is concerned. That's why contractors with an eye to the future standardize on Aquatowers and AquaCoolers for every job, thus fortifying their own good reputation with Marley's record of 35 years' successful cooling tower engineering and production.

MARLEY

**The Marley Company** Kansas City, Missouri

# *Inside Dope*

By GEORGE F. TAUBENECK

*(Concluded from Page 1, Col. 1)*

comb grew wrathy when his office sweltered on a particularly hot July day.

So he phoned the installing firm—again and again and again. Always a busy signal.

Inasmuch as he'd approved the bills, he felt entitled to wire a hot protest to the manufacturer. This got results.

Next day a manufacturer's field representative showed Auditor Edgecomb how to turn a button to the "ON" position.

### *Serviceman's Nightmare*

Rush call to a New York apartment house (Park Ave. and 49th) posed a new problem to an air conditioning serviceman.

A thirsty pigeon had burrowed into a room air conditioner, and died there.

Carefully the serviceman removed the remains, disinfected the room unit, and sprayed drugstore cologne all around.

Guess what happened:

He was sued, the manufacturer was sued, and the complaining tenant departed for an untraceable new address.

### *Happy Chickens*

Next to sheep, chickens possibly are the most stupid animals on earth. But they never had it so good as they are going to get it.

Extensive investigation by the Universities of Illinois and Penn State prove conclusively that air conditioned hen houses more than pay off by upping egg production, and by fatting fryers for the market much faster.

"Happy chickens," classmate of ours at the University of Illinois writes, "grow bigger quicker, and lay more eggs. Air conditioning makes them happy."

As a boy "Dope" fed and raised chickens. Never saw any poultry register a whit of emotion. But we're quite ready to believe our professor of agriculture friend when he declares that air conditioning makes chickens happy.

As the patent medicines of yore advertised:

"It's good for man or beast."

### *Hot Umpires*

When Joe Engel (owner of the Chattanooga S. A. baseball team) gets mad at the umpires, he shuts off the air conditioning system in their dressing room.

### *How to Find Your Auto*

Thanks to air conditioning, Mrs. Ellis Mills III discovered, sooner than she would have otherwise, that she was driving someone else's automobile.

En route from National Airport, Washington, D. C. to her home near Leesburg, Va., Mrs. Mills began to feel chilly. So she rolled up the car windows.

Instead of getting warmer, she got colder. This puzzled the lady no end until she discovered that the car air conditioner was operating. But this discovery left Mrs. Mills more baffled than ever since her car is not air conditioned.

Pulling off the road and getting out to ponder this astonishing situation, Mrs. Mills noticed that the license plates on the car were not Virginia tags—as they should have been—but Illinois plates.

So she drove to a police station and told her story to an officer. He arranged for a police escort back to the airport.

At the airport was Mrs. Mills' car, which was exactly like the one she had been driving—a late model, four-door, dark gray Cadillac — except that hers wasn't air conditioned. The same key fit both cars.

### *Wayward Installer*

Air conditioning has become a big thing in almost everybody's life and the problems of the little window boxes are many and varied. This story concerns two women in adjoining apartments in Forest Hills, New York.

These neighbors have had a mad on for some years and do not speak. Recently one of them bought an air conditioning unit. The other almost immediately hired a lawyer and sued her neighbor. The conditioner, she charged, had set up such a vibration that it had knocked two expensive vases off her wall and busted both of the same. She wanted damages.

The case never came to trial. The gal with the air conditioning machine had no trouble proving, that although she had owned the gadget for three weeks, nobody had bothered to come and hook it up for her.

### *Air Conditioning, Poker, And Singapore*

What a headline! Outside of *Mother, Home and the Flag*, can't see how we could beat its appeal—for this column at least.

We're ALL excited about air conditioning. Furthermore, almost everybody we know in our industry loves to play poker. And Singapore has the most intriguing connotations . . . dusky Marilyn Monroes, sinister dragnets, exotic mysteries, wicked deals. . . .

Anyway, a remarkable character who lectures under the name "Singapore Joe" Fisher told us a story which combines all three sure-fire elements.

For 20-odd (and we do mean ODD) years Fisher operated the Capitol Theater in Singapore. In the early twenties a Carrier representative sold him on air conditioning his showplace.

Dammit, the Singapore Health Commissioner wouldn't issue a permit.

"My constituents," he haughtied down his monocle, "would catch pneumonia in those cold draughts."

Fisher air conditioned one room of his house, and tried to entice thither the Health Commissioner and other political biggies for a demonstration. No dice, pneumonia, y'know.

Later, in a poker game with these same politicos, he won $700. The losers cried for revenge. Joe's terms: the return game had to be played in his air conditioned room. For a chance to get their money back pneumonia seemed a minor hazard.

You can write the tagline to this story. Joe let 'em win, nobody caught even a sniffle of a cold, the bigwigs were enchanted with air conditioning, and Fisher got his permit .

Thus were the Malay States opened up as a prime market for the American air conditioning industry.

***A CHAIN REACTION***—one sale leads to another when users experience the twin advantages of H&M's Water-Cooled Condensers—peak efficiency and lowest maintenance.

Double-tube design and counterflow introduction of water and refrigerant assure most efficient heat transfer. Refrigerant flows through the outer tube and the water through the inner tube for maximum heat interchange.

Removable headers permit easy water tube cleaning with a simple, accessory cleaning tool. Scale and sludge which reduce heat transfer are removed without harmful chemical cleaners. Condenser capacity is maintained at clean-tube performance ratings for unit lifetime.

Condenser compactness makes these units ideal for conversion of under-capacity air-cooled refrigeration systems. All H&M units are U/L approved for use with refrigerants -12 or -22.

Call your wholesaler or write *Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.*

***ONLY HALSTEAD & MITCHELL OFFERS THIS WIDE CHOICE***

**HEAVY DUTY** (Type T) condensers have a highly favorable fouling factor and are designed for long service between cleanings. ⅓ through 25 tons.

**STANDARD DUTY** (Type EL) are made with extended surface water tubes, ideal for water-cooled systems under all average conditions. ⅓ through 3 tons.

**REPLACEMENT CONDENSERS** (Type R) are shorter, higher condensers designed for use in package air conditioners. Easily installed. 1½ through 10 tons.

**SEA WATER CONDENSERS** (Type SW) are made with cupro-nickel water tubes and naval brass headers for resistance to impure water. ⅓ through 25 tons.

HM Halstead & Mitchell




*For more information about products advertised on this page use Information Center, page 22.*

## *Ratio of Engineer Demand Highest In Air Conditioning*

LOS ANGELES—Nearly four times general industry demand for engineers was indicated in the field of air conditioning at the California State Polytechnic college this June.

This was disclosed in a report made public by the Institute of Heating and Air Conditioning Industries from Cal Poly Engineering Dean Harold P. Hayes, technical advisor to the institute.

Forty-six companies visited the campus and conducted interviews for air conditioning and refrigeration engineering graduates, Dean Hayes said.

Since there were 21 graduates, this was a ratio of better than two companies per graduate. This compared with a total of 150 companies on campus to interview 229 engineering graduates in aero, architectural, electronic, electrical, and mechanical categories.

"Cal Poly is the only school in the United States to award degrees in air conditioning and refrigeration engineering, and therefore the only school where a cross section of engineering demand study is possible," it was stated. "The 1957 registration showed students from as far away as Japan, the Azores, Alaska, Siam, Mexico, Hong Kong, Hawaii, and Israel."

Dean Hayes said the demand for air conditioning engineers was indicative of increasingly great public demand for year-round environmental control especially in industry, where air conditioning has been demonstrated to increase worker productivity.

One-fourth of all the Cal Poly air conditioning graduates accepted offers with training programs in eastern states.

Dean Hayes' report, the institute said, showed an increasing comparison of starting salaries offered engineering graduates. The comparison follows:

| | Average | High |
|---|---|---|
| Air conditioning | $451 | $510 |
| Aero | 470 | 555 |
| Architectural | 466 | 500 |
| Electrical | 462 | 550 |
| Electronic | 488 | 569 |
| Mechanical | 467 | 569 |

## Hupp Export Sales Director Tours Europe, Middle East

CLEVELAND—P. D. Middleton, director of export sales, Europe and the Middle East of Hupp International, division of Hupp Corp., recently left on an extended tour of Holland, France, Germany, Scandinavian countries, Iran, Iraq, Syria, Lebanon, and other countries to visit the distributors of Hupp Corp. divisions including Gibson Refrigerator Co., Perfection Industries, and Typhoon Air Conditioning Co., it was announced.

Middleton will also start a sales development program for Hupp's Holland factory in Hengelo to supply the European market with locally manufactured Hupp licensed products, it was added.

*Stamp Plan Results*

## Section In Los Angeles Newspaper Tells Story Of Air Conditioning

LOS ANGELES—The story of air conditioning — how it works and how it affects the comfort and health of the public—was told by the Institute of Heating & Air Conditioning Industries in the Home Magazine of the *Los Angeles Times* recently as another Stamp Plan feature.

The story, a companion piece to an authoritative article on heating which appeared in Home last March, carried the by-line of IHACI President Robert N. Hall. It was part of a coordinated series of Stamp Plan public relations activities designed to help upgrade the industry through consumer information and education.

## *Jurists Ask Cooling For Niagara Falls Court, Jury Rooms*

LOCKPORT, N. Y.—A request to have the second floor courtrooms and the third floor jury rooms of the County Building, Niagara Falls, air conditioned was received by the Board of Supervisors at its regular meeting and referred to its Building Committee.

The letter came from Supreme Court Justices John S. Marsh and Regis O'Brien and County Judge Frank J. Kronenberg.

The jurists noted that spring, summer, and early fall sessions are held there and the temperature is often 90°. "It becomes almost impossible to conduct business in the deliberative atmosphere essential to the proper conduct of the courts," the jurists contended in their request.

## Noise Abatement Group Invites Industry To Bring Problems to Chicago Oct. 10-11

CHICAGO — Industry is invited to bring its noise control problems to the 8th annual National Noise Abatement Symposium at the Sherman hotel here on Oct. 10 and 11.

The invitation was issued by conference chairman Daniel R. McAuliffe, research physicist at Armour Research Foundation of Illinois Institute of Technology.

The Foundation is one of a group of research and professional organizations sponsoring the annual forum on effect, measurement, and control of noise.

A group of experts, McAuliffe said, will devote one full afternoon session to answering written questions from the floor dealing with individual problems. Approximately 12 technical papers and two luncheon speakers will complete the two-day program.

The Oct. 10 discussions will deal with the causes and cures of factory noise and community noise. The following day will be devoted to discussions of various types of acoustical treatment and their limitations, and the question and answer period.

Inquiries concerning the conference should be sent to Conference Secretary J. J. Kowal, Armour Research Foundation, 10 W. 35th St., Chicago 16, Ill.

**For Your Reprint Copy**

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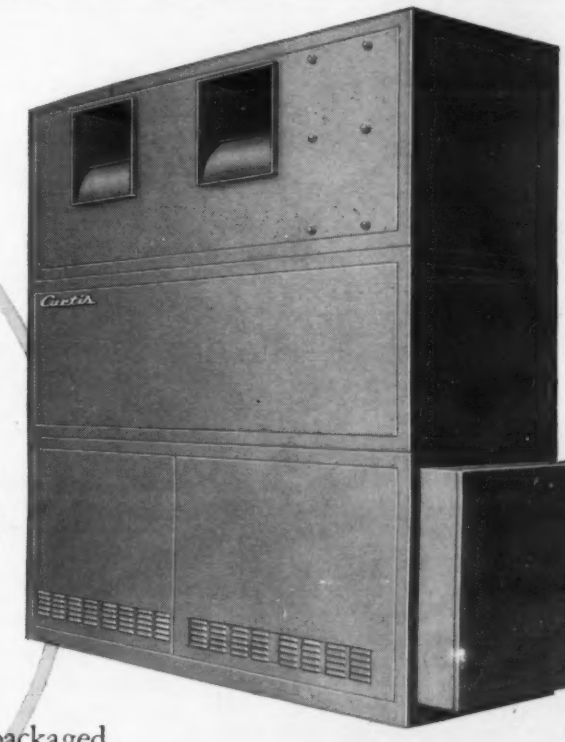
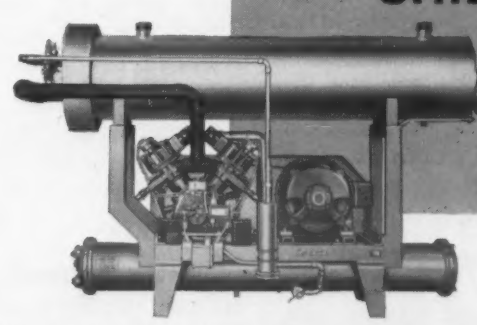


No question about it. The new 50-ton Curtis packaged air conditioner will open a new sales front for you. Architects, engineers *and* owners prefer packaged units for important reasons:

- Big package units are line assembled—does away with expense of field labor. Assures a BALANCED SYSTEM.
- Packaged units are easier to install—take up less space.
- Cuts down installation problems and maintenance costs.

IMPROVED PACKAGED LIQUID CHILLER... FOR WET HEAT SYSTEMS



up to 100 tons—

With all controls in single panel box for easier access and greater protection! Four step capacity control—unloaded starting available. Particularly desirable where year 'round conditioning of multiple individual rooms is required.

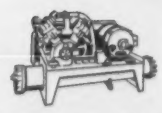
**REMEMBER,** every Curtis unit is backed by a solid 103 years of experience and skill. Curtis offers a complete line of air conditioning equipment—nationally advertised to help you sell.

YOU CAN COUNT ON REMEMBER... Curtis

OUR 103rd YEAR

MANUFACTURING COMPANY
REFRIGERATION DIVISION
1912 Kienlen Ave. St. Louis 20, Mo.
CM-16

New Curtis Packaged, Air Cooled, Air Conditioning Units, 3 thru 7½ tons. Residential and commercial applications.



Condensing Units up to 100 tons. F-12 or F-22.

Air Handling Units, Cooling Towers and Evaporative Condensers to match.

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"The mass of people must be barbarous where there is no printing, and consequently knowledge is not generally diffused. Knowledge is diffused among our people by the newspapers."—*Sam Johnson, Boswell's Life,* March 31, 1772.

## They'll Do It Every Time

by Jimmy Hatlo

HAVE A NICE VACATION, J.B. ···· IS THAT THE LIST? VERY GOOD, SIR··LEAVE EVERYTHING TO ME····
OH-OH··· EVERY TIME BIGDOME GOES ON A TRIP, SOMEBODY GETS THE OL' HEAVE-HO!!
TRIPS COST DOUGH···SO HE'LL MAKE IT UP WITH THE FIRING SQUAD····
YEAH! HE AIN'T GOT THE NERVE TO DO IT, HIMSELF··· HE LEAVES IT TO HANG-KNOT, THE HATCHET-MAN····
MAYBE IT'S ONLY A LAUNDRY LIST··WHO COULD HE FIRE? EVERYBODY HERE IS DOING TWO JOBS NOW···
WORRYING AS BOSSO SNEAKS OFF AFTER A WHISPERED CONFERENCE WITH EFFICIENCY JOE····
JIMMY HATLO
2-6
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# Puzzle for Americans— Is This Inflation Planned?

ECONOMISTS, as usual, are puzzled. Bewitched, bothered, and bewildered. Inflation, it seems, is occurring although many of the standard textbook formula ingredients for inflation are missing.

***We have overcapacity,*** underconsumption, high interest rates, "tight money"—all the classic ingredients for *deflation.* Yet prices continue to rise. Why?

Some blame monopolistic "administered prices" (unholy collusion between Big Unions and Big Corporations).

Others point an accusing finger at government expenditures for atom bombs, guided missiles, supersonic planes, etc.—which give the workers who produce them money to spend for weapons nobody can buy.

A third group, possibly more realistic, take the pessimistic view that since the days of Franklin Delano Roosevelt the American people have been conditioned to expect "full employment." Any political leader who does not give lip service to that concept is a dead duck.

***Yet, "full employment"*** means increasing inflation. Bigger payrolls at ever rising rates, regardless of whether or not there is matching work to be done, are the consequence of this policy.

If *anyone* in Washington is seriously interested in stopping inflation (Eisenhower isn't alone in culpability) it could be done by cutting off billions of appropriation dollars for things we don't really need.

In any economy, when the producers no longer can support parasites in the style to which the latter have become accustomed, something has to give.

The price inflation we are now witnessing —in the face of decreased demand and excessive productive capacity—could lead to the "hair-curling" depression mentioned by Secretary Humphrey. We doubt that it will, but it *could.*

***Trying to be Santa Claus*** to everyone is a sure route to inflation. Retired elderly persons, bondholders, schoolteachers, salaried personnel, even government employes suffer especially from planned inflation. Few such are prepared to withstand shrinkages in their purchasing power. Inflation of money and credit wipes out their savings, decimates their pensions, and makes them fearful of the Future.

All business-planning and long-term investment programs become hazardous in the face of so dangerous a fiscal policy. Inflation mocks insurance and bank accounts, and destroys incentives to save. It fosters small-business bankruptcies, big-business economic paralysis, and historically sets the stage for political dictatorships.

***Seems that everybody is out for*** a fast buck at the expense of everybody else during an "easy money" period. (And nearly everyone gets clipped in the process.)

A general air of unreality enters the social scene, also. People exposed to such inversions of basic values cannot be expected to remain thrifty, productive, or politically stable.

Automatic annual union wage boosts prevent price reductions either in rapidly expanding or experienced solid industries. Such across-the-boards wage increases, in turn, push up wages in those industries which are not enjoying rapid advances in scientific productivity or imagineered public acceptance.

America's economy is so interwoven and intertwined that ANY cost increase causes many other price uppings among all types of goods and services.

***To government this situation*** poses a difficult problem. If an Administration and Congress do not make available inflationary money and credit for ambitious businessmen and labor-union bosses in a continuous spiral, unemployment may ensue temporarily. On the other hand, if they do ease borrowing power to meet these ambitious demands, inflation is certain.

There is only one way to curb inflation (if indeed our citizens make the difficult decision to tighten their belts and be realistic). That is: stop huge government spending for things which aren't absolutely necessary.

To one in whom love dwells, all the world are brothers.—*Buddhist text.*

Life's a succession of tremendous trifles.

## FRENCH READER ENJOYS 'VISITS' WITH 'DOPE'

Kelvinator
Paris, France

Editor:

Let me take this opportunity to tell you how interesting is your paper, especially for those who, like me, live far from the States. The NEWS is the only way I have to be kept posted with all that's new. Also, "Dope" is always for me a good visit with you.

ANDRE DELALANDE

## ELECTRIC HOME HEATING EDITORIAL 'ENCOURAGING'

Electriliving Corp.
Indianapolis, Ind.

Editor:

Even before we had an opportunity to read your June 3 editorial on "Space Heating by Electricity is Incubating Encouragingly" several copies were sent to us by friends in several parts of the country.

We have subscribed to your NEWS for several years to keep an eye open for some evidence of progress in this phase of the comfort producing business. Of course, we are encouraged to see you devote an entire editorial to the subject of electric home heating.

CLEMENT L. STANFORD

## WANTS REPRINTS OF PRICING EDITORIAL

Hill York Corp.
Orlando, Fla.

Editor:

I read with a great deal of interest your editorial in the NEWS entitled "The Industry Is Pricing Itself Out of Business."

I am wondering if this could be reprinted in pamphlet or single sheet form. We would like approximately one hundred of these reprints.

ROBERT M. COX,
General Manager

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# Bakery Refrigeration Solves Profit Problem

## *Holding Refrigerator, Retarder Box, Display Case Reduce Overtime and 'Stales' for Supermarket Chain*

DES MOINES, Iowa—The installation of a 22-cu. ft. four-door holding refrigerator, in which ready-baked goods can be held at 8° F., plus a 40° retarder box, and a refrigerator display case have been combined to solve serious profit problems for the bakery department of the Thriftway Super Market, here.

The Thriftway bakery serves not only the store in which it is located, but three other Thriftway units in the city, where, as is usually the case with baking operations, there is a sharp fluctuation in demand from day to day.

### STALES REPRESENT LOSS

Consequently, the Thriftway store located in the new area, frequently found itself with a large accumulation of leftovers and stales, which, of course, represent a dead loss.

With the problem complicated by the four stores being served from the same bakery, there was every likelihood that what appeared to be a profitable week could suddenly be wiped out because of an over-accumulation of unsold baked goods.

### REFRIGERATION VIEWED AS SOLUTION

After reviewing the situation, it was decided that the ideal solution lay in a refrigeration system which would permit the Iowa bakery to produce a backlog of baked goods, sufficient to cover any unexpected rush or heavy load, while permitting the bakery to operate on an every-day production schedule held within profit minimum.

This theory has been proven completely practicable with the installation of the holding box and the retarder box, which permits the bakery to maintain a stock of both baked and unbaked goods.

Under the plan, a minimum of two days' supply is baked for all popular baked goods items, and held under low temperature refrigeration for a maximum of three days.

Meanwhile, another stock, largely dictated by the season, the amount of advertising which has been allocated to the items, etc., is make up unbaked and kept in the retarder box, where each may be baked to take care of special orders, large-quantity orders, etc., without tapping the holding box.

In this way, the actual back up stock is equal to approximately one and one half days' market load in both unbaked and baked versions, and, depending upon the type of sales made the bakery can draw from either source.

Incidentally, holding the baked goods for three days is an absolute "maximum" which Thriftway has set as most conducive to retention of flavor, appearance, and texture. Even though most of the baked goods concerned would last much longer than three days under such low temperature refrigeration, any unsold at the end of that time is culled out.

"The combination of the freezer and retarder has also made it possible to reschedule working hours in such a way that bakers can work for shorter periods of time and still produce everything necessary to meet the demand in all four stores," it was pointed out.

"Also, we are able to buy supplies more accurately and can handle any order for a specifically-decorated birthday cake, for example, without being forced to drop one type of baking to handle it."

# *All Kelvinator Chest-Type Ice Cream Cabinets Have Stainless Steel Lids*

DETROIT — All Kelvinator chest-type ice cream cabinets now have stainless steel lids as standard equipment, according to Don H. Carter, manager of the commercial division. The new lids offer many important advantages over the conventional plastic lids, Carter pointed out.

Fabricated from nickel stainless steel, the soft satin finish of the new lids gives a neater, more pleasing appearance. Yet the lids are exceptionally durable and will not stain, mar, burn, or crack, Carter said.

"To test the durability of the stainless steel lids, Kelvinator made a gruelling 'rough use' laboratory test," it was noted. "Each side of a lid was machine-slammed 200,000 times—a test equal to many years of hard use.

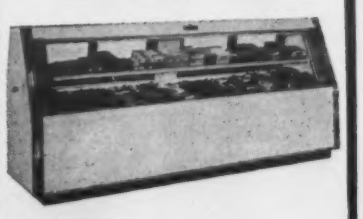
In spite of this laboratory punishment, the Kelvinator stainless steel lids remained in 'like new' condition."

To insure top insulation efficiency, the lids are filled with epoxy-polystyrene—a low temperature insulating material claimed to have long service life, and to be highly resistant to heat passage and totally impervious to moisture.

The process involves the pre-expansion of polystyrene beads under infrared heat to form a rigid foam-like structure with millions of tiny, non-interconnected cells, it was further explained.

NOLIN

MEAT DISPLAY CASES



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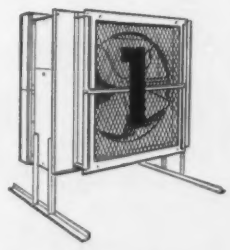
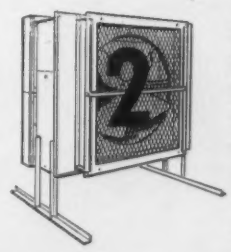
ONLY KRAMER
UNICON + WINTERSTAT* GUARANTEES ALL 4

MAXIMUM LIQUID PRESSURE AT EXPANSION VALVE IN WINTERTIME



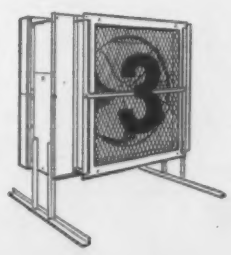
Only the Kramer UNICON plus WINTERSTAT guarantees the full refrigerant pressure *at the expansion valve* for full cooling capacity — even at below 0°F outdoors — *automatically!*

MAXIMUM SUMMER CAPACITY WITH PATENTED WINTERSTAT



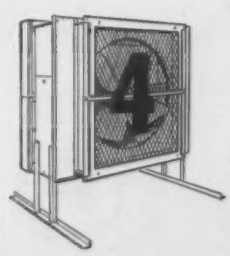
Only Kramer UNICON plus WINTERSTAT guarantees maximum condensing capacity in summer. In hot weather, the patented WINTERSTAT is out of the refrigerant circuit, permitting normal drainage from the condenser without restriction. This assures maximum condensing capacity in summer — *automatically!*

PROMPT DEFROSTING AT ANY OUTDOOR TEMPERATURE



The use of UNICON plus WINTERSTAT makes Kramer THERMOBANK the only low temperature system that can guarantee operation and complete defrosting at any outdoor temperature—even 0°F or lower — *automatically!*

IMMEDIATE COMPRESSOR START-UP REGARDLESS OF OUTDOOR WINTER TEMPERATURE



Only Kramer UNICON plus WINTERSTAT (using modification #1) ensures positive and immediate compressor start-up with pressurestat operating the system, regardless of outdoor winter temperatures at the UNICON and regardless of length of compressor lay-off — *automatically!*

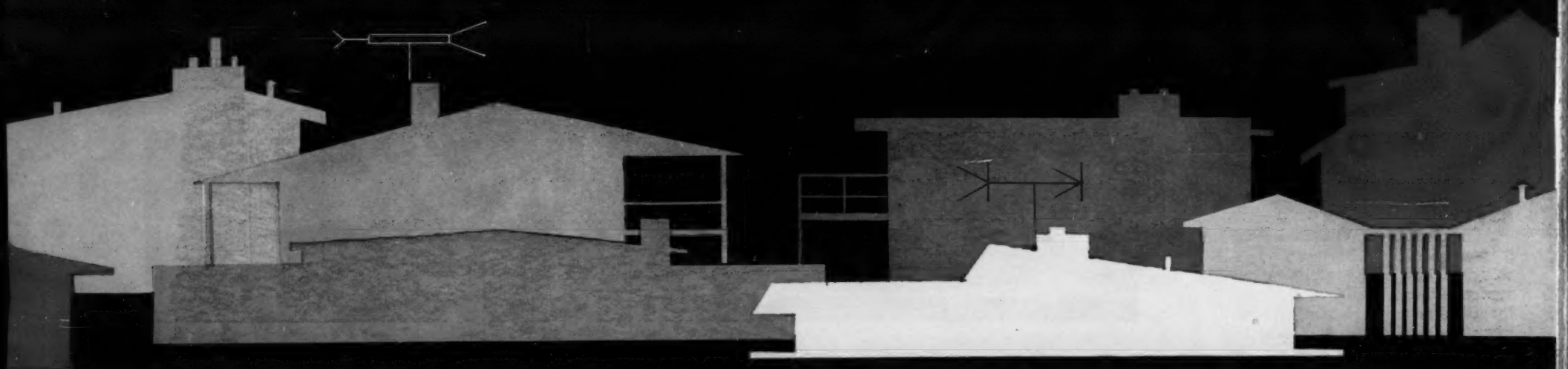
**UNICON is a remote type air-cooled condenser WINTERSTAT is a year 'round automatic head pressure control*

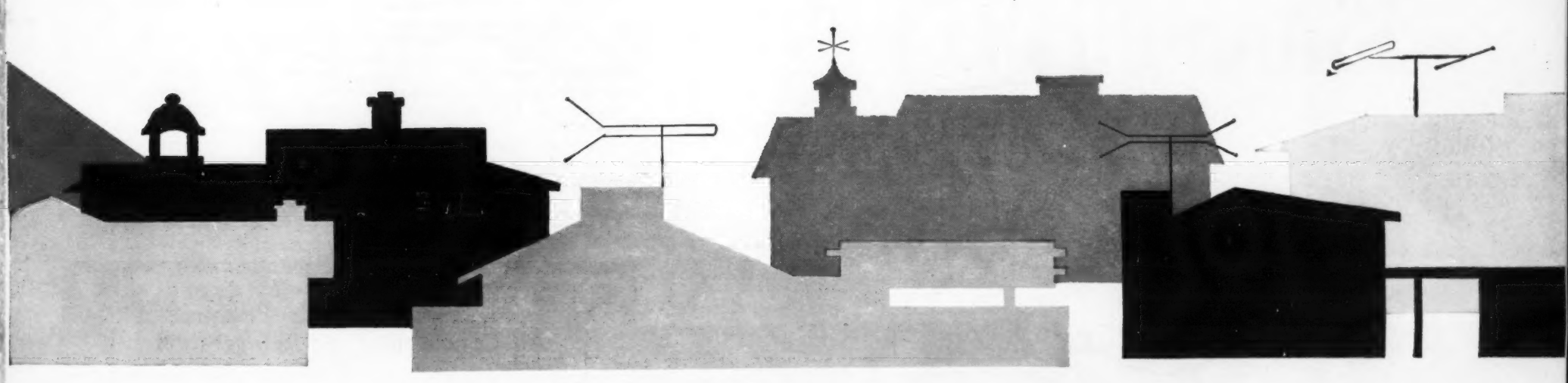
WRITE FOR BULLETIN U-210-L

KRAMER TRENTON CO. • Trenton 5, N.J.

43 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

# There's no such thing as an Average House





## Only Westinghouse gives you "Just Right" Air Conditioning for each home!

It's a fact! Cooling requirements differ from house to house. Size, style, exposure, local climate, number of inhabitants—and more, all make a difference. You'll find that Westinghouse—the only "Really-New" Air Conditioning line—gives you the *one best* unit for each of your customers—wherever you sell.

While competitors *try* to satisfy all customers with but 3 remote condensing units (2, 3, and 5 HP), Westinghouse gives you 7! With Westinghouse there's no "too much or too little" cooling capacity . . . you can close each sale with cooling that's "Just Right" for the job. And you can do it with profit, because "Just Right" cooling means *just right* pricing!

That's not all! New Westinghouse units are air cooled; install easily out-of-doors . . . combine with any forced warm air heating system (using the same ducts). Deliver complete home air conditioned comfort automatically—at the touch of a finger tip. Finished in handsome beige and charcoal, they blend with any exterior decor. They're *whisper quiet* . . . exhaust air up and away from house . . . do not annoy neighbors or damage shrubs.

What's more, Westinghouse Dealers get—fast delivery, sales training, technical aid, finance plans, local advertising, sales promotion—and more. These are just a few of many reasons why a Westinghouse Franchise is so highly valued by leading contractors and dealers across the nation. For complete details write to: Westinghouse Air Conditioning Division, Dept. 1G22, P. O. Box 510, Staunton, Virginia.

J-80540A

YOU CAN BE SURE...IF IT'S

# Westinghouse

AIR CONDITIONING DIVISION STAUNTON, VIRGINIA

## Oil Packet Boiler Made in Four Sizes

—KEY NO. G-811—

JOHNSTOWN, Pa.—A new cast-iron oil-packet boiler was recently introduced by National-U. S. Radiator Corp.'s Heating & Air Conditioning Div. It is available in four sizes, ranging in B.t.u. output from 67,000 to 158,000 B.t.u.

Called the "Sunray IV," the new packet is an all-in-one automatic home heating unit that, according to its manufacturer, "offers more basic innovations than any similar size unit on the market." It is also available without circulatory pump and automatic controls, or as a "boiler" without oil burner.

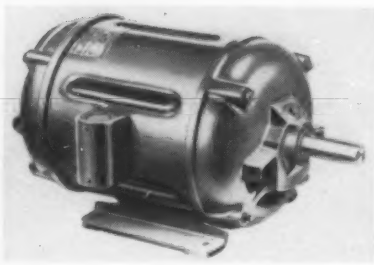
The packet units combines a new-type boiler with a simplified, high-pressure atomizing or "gun" type oil burner, especially designed for it.

## Electrostatic Filter Made to Measure

—KEY NO. G-812—

CHICAGO—Stoddard Industries, Inc. recently introduced a new L-type, "Dust-magnet" electrostatic air filter.

These new filters are made to measure to any size or shape. The L-type Dust-magnets are bound in flexible silver-colored plastic, which allows the filter to be rolled or folded for shipping and also enables it to be installed in curved positions.

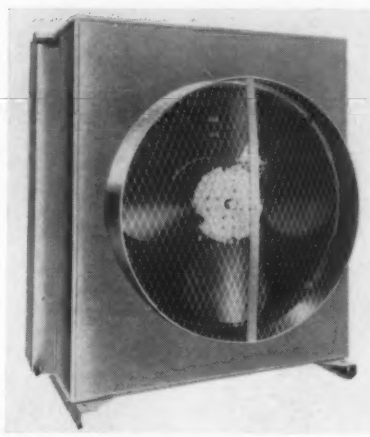


## Wagner Motors Built In New NEMA Frames

—KEY NO. G-813—

ST. LOUIS—Wagner Electric Corp. has announced that its repulsion-start induction single-phase motors, in integral horsepower 4-pole ratings 1 through 5 hp., are now being built in new NEMA frames 182 through 254U.

Placing these motors in the new frames making them interchangeable with capacitor-start and small polyphase motors of the same ratings, was accomplished without changing in any way their electrical characteristics, according to Wagner.



## New 'Zephyrcons' Have Belt-Driven Fans

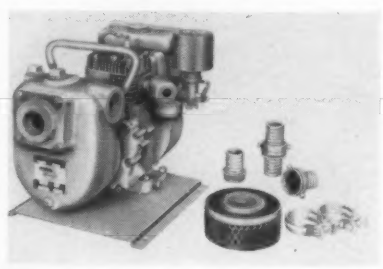
—KEY NO. G-814—

ATLANTA — New belt-driven fan models have been added to the line of "Zephyrcon" air-cooled condensers, according to Larkin Coils, Inc.

The belt-driven BFC models are built in 5, 8, 10, 15, and 20-ton capacities and operate at low noise levels. Direct-drive FC models are produced in 2, 3, 5, 8, and 10-ton capacities and are said to require minimum maintenance.

"Posi-Trol" control system is available as optional equipment for use with both series. This system maintains head pressures in low ambient temperatures to assure peak performance the year-round.

Zephyrcons pull air over the entire surface of the condensing coil for even air distribution. Motors on the belt-driven models are of standard NEMA drip-proof design, mounted on an adjustable base.



## Pump Takes More Load Under High Pressure

—KEY NO. G-815—

LANCASTER, Pa. — Lancaster Pump & Mfg. Co., Inc. has introduced a new self-priming portable contractors pump.

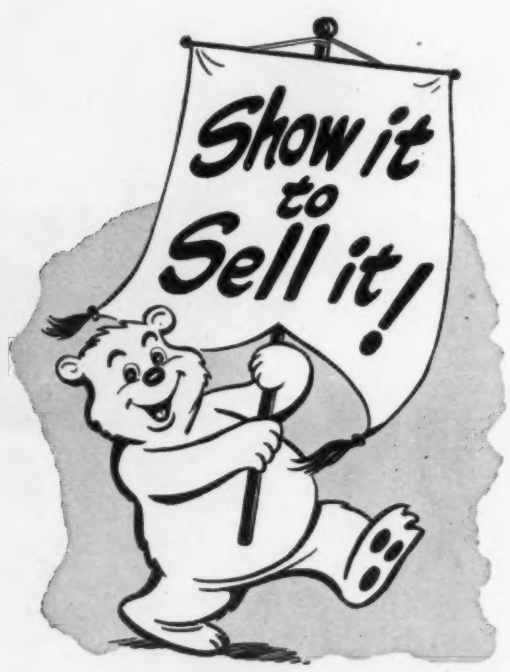
In addition to the usual features found in pumps of this type, the new Lancaster features a four volute cut-off design which yields extra high capacity in the high pressure range without overloading the 2-hp. four-cycle gas engine, the firm stated.

## B&G Adds 2 Series of Stainless Steel Pumps

—KEY NO. G-816—

MORTON GROVE, Ill. — Two series of stainless steel pumps are now available from the Bell & Gossett Co. Since all wetted parts are 316 stainless steel, the pumps are suitable for food products and most chemical process liquids.

Many models are available in uni-built and long-coupled design. Capacities range upwards to 200 g.p.m. and heads to 120 ft. The pumps feature quiet operation.


IF you make a product or provide a service for the air-conditioning, heating, or commercial refrigeration industry, you should have a display at the 10th Exposition of the Air Conditioning and Refrigeration INDUSTRY.

This will be a tremendous show, far exceeding the size of the last Expositon. Fifteen thousand buyers of this multi-billion dollar industry will be there . . . all looking for what is new and better . . . comparing price and quality.

**It is the one marketplace of the industry.**

**It is the place where people come to buy.**

**It is the place where sales are made.**

Your salesmen will contact more prospects at this show, in only four days, than they could elsewhere in months.

A display of your products will open up new distribution channels and result in a real sales increase in 1958.

Sale of space already exceeds that for the last Exposition at Atlantic City in 1955. Cost of space is $4 per square foot. But don't wait, for while plenty of space is still available, good space is going fast.

• **Write, wire, or call Geo. E. Mills, Show Director, 10th Exposition of ARI, 1346 Connecticut Ave., Washington, D. C., for full information—COlumbia 5-0405.**

TEMKON

Air Conditioning and Refrigeration

TEMPERATURE LIMITED

Burlington Road, London, SW6. Cables: Temtur, London

Largest Producer of Air Conditioning Units outside the U.S.A.


## Information Center

For *more information* on What's New products, current literature and catalogs available, equipment advertised in AIR CONDITIONING & REFRIGERATION NEWS use Key Numbers where designated or specify products advertised and we'll see that you receive this information promptly.

**Products Advertised**
(list name, page, and issue date)

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**What's New or Current Literature Available**

Key No. . . . . Key No. . . . . .
Key No. . . . . Key No. . . . . .
Key No. . . . . Key No. . . . . .
Key No. . . . . Key No. . . . . .
Key No. . . . . Key No. . . . . .

Name . . . . . Title . . . . . .
(Please Print)

Company . . . . . .

Street . . . . . .

City . . . . . Zone . . . . State . . . . . .

Type of Business . . . . . .

MAIL THIS FORM TO

**AIR CONDITIONING & REFRIGERATION NEWS**
*Readers Service Dept.*
450 W. FORT ST. DETROIT 26, MICHIGAN



*For more information about products advertised on this page use Information Center, page 22.*

## Machine Joins Elbows, Pipe Sections Faster

——KEY NO. G-817——

BUFFALO—A new method for joining round, heavy gauge elbows and pipe sections has been developed by Niagara Machine & Tool Works.

Specially designed offset rolls reduce joining time 50%, the company states. One set of rolls and a gauge do the edging job in a single operation. Of hardened, polished steel, they are available for both hand and power models of Niagara Combination Rotary Machines.

## Reversing Capacitor Motor Runs Valves

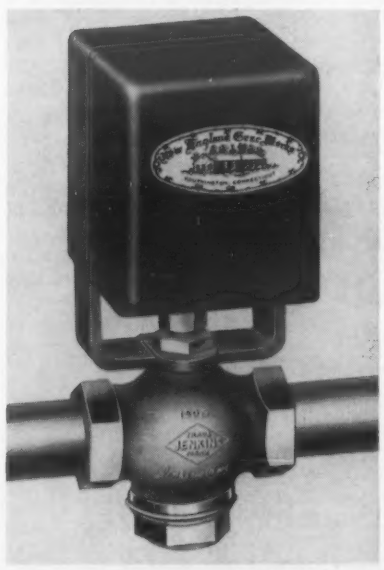
——KEY NO. G-818——

PHILADELPHIA—A new electric motor designed to operate rotary, slipstem, and butterfly valves, dampers, and other final elements in automatic control systems has been introduced by Minneapolis-Honeywell Regulator Co.'s Industrial Div.

The motor, a reversing capacitor type known as the "Actionator," is manufactured in two basic models. One unit (M 630) is designed for two-position and floating control; and the other (M 930) for proportioning control.

New motor units are compact, approximately 6 in. in diameter and 10 in. wide, and weigh 11 lbs. They incorporate a gear train that permits a selection of timings from 7.5 seconds to 120 seconds, depending on model.

## Motorized Valve Made In 10 Sizes

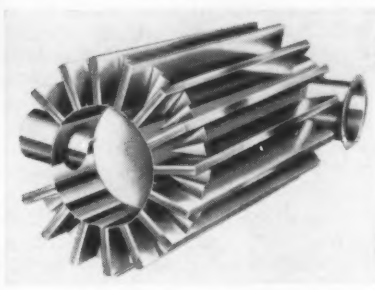


——KEY NO. G-819——

SOUTHINGTON, Conn. — "New England" motorized valve, made by New England Gear Works, is available in 10 sizes; ¼ in. to 3 in. —Jenkins bronze globe body, three voltages; 24 v., 115 v., and 230 v.

It is also offered in three timing cycles; eight, 32, and 139 seconds.

## Finned Type Heat Exchanger Avoids Hot Spots



——KEY NO. G-8110——

MARSHALLTOWN, Iowa—Lennox Industries, Inc. recently developed a new finned-type heat exchanger, it was recently announced.

Combustion gases are forced through long thin fins which quickly transfer heat to the recirculated air.

Special turbulators make the air "scrub" the fins to pick up the maximum amount of heat, it was explained.

The new heat exchanger does not get as hot at points of heat concentration near the combustion chamber. In this critical area, the manufacturer has provided over twice as much steel perimeter to dissipate the heat quickly, and a metal liner surrounds the heat exchanger to keep the outer cabinet from becoming hot.

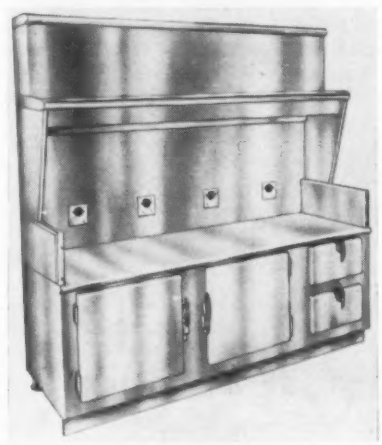
## New Gasketing Seals At Lower Pressure

——KEY NO. G-8111——

LANCASTER, Pa. — Five new high density fiber gasketing materials that make it possible to obtain seals at lower flange pressures have been developed by the Industrial Div. of the Armstrong Cork Co.

The new materials enable the company to offer a more complete line in the "Accopac" series, a recently developed group of gasketing materials that are claimed to have more flexibility, dimensional stability, and uniformity than conventional fiber gaskets offer.

## Allmetal Adds Base-Updraft Equipment Stand



——KEY NO. G-8112——

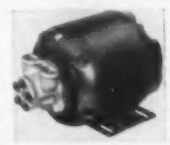
NEWARK, N. J.—A new refrigerated base-updraft equipment stand has been added to its complete line of wood-free constructed refrigerated and non-refrigerated back bar and counter line equipment by Allmetal Food Equipment Corp.

This new equipment stand has been designed for increased work efficiency. The "Hide-A-Way" grease filters have been concealed to eliminate unsightly, dirt-collecting louvers. The new superstructure side supports are slanted to insure greater working freedom.

## Pump and Driving Motor Units Close Coupled

——KEY NO. G-8113——

CHICAGO — The Tuthill Pump Co. recently announced a new series of positive displacement pump-and-driving-motor units.

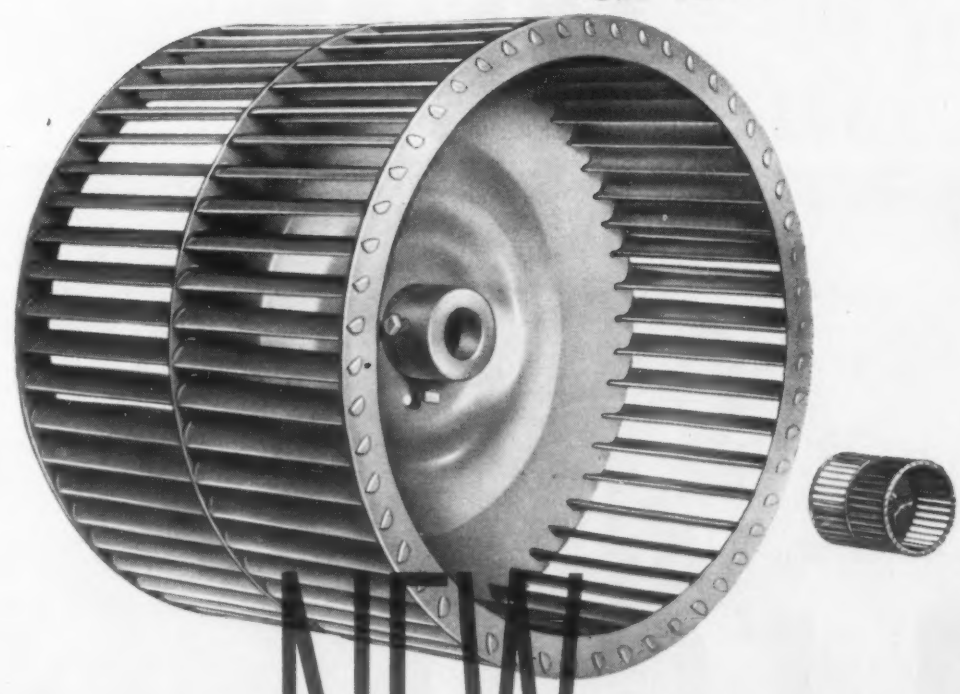


These are offered for singular plant applications which do not warrant custom design. They can be used in varying combinations for hydraulic, oil burning, lubricating, and other services involving many different fluids.

These Tuthill pump-and-driving-motor units are close-coupled—have the pump mounted on the motor.


*a new peak in* **PERFORMANCE**

• 35% LIGHTER WEIGHT • MORE RPM'S • MORE VOLUME • LESS SPACE



**REVCOR'S NEW BLASTAIRE**

**DOUBLE INLET BLOWER WHEELS**

Exclusive Revcor *Single center disk* construction eliminates extra weight and reduces air loss. Individual blades extend through perforations in the center disk and are locked tight to the center disk by Revcor's own patented method. Center disk can be positioned "off center." *Blades are attached to end rings by Revcor's time-proven tab locked method.*

**DOUBLE INLET WIDTHS FROM 2" to 12"...and DIAMETERS FROM 3" to 12¾"!**

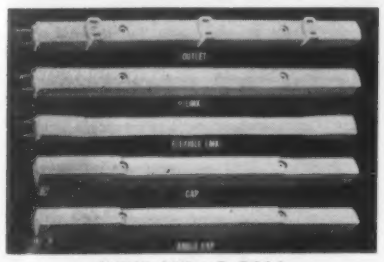
***Revcor* Single And Double Inlet *Blastaire* Blower Wheels Are Used By Over 60% Of The Room Air Conditioner Manufacturers!**

**AVAILABLE—BLASTAIRE TECHNICAL DETAILS**

ENGINEERS Revcor INC. MANUFACTURERS

**251 EDWARDS STREET, CARPENTERSVILLE, ILL.**

## 'Snapit' Wall Outlets Come In 5 Types



—KEY NO. G-8114—

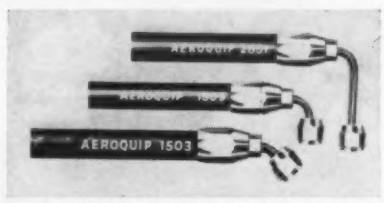
PROVIDENCE, R. I. — "Inter-Link" is being marketed under the "Snapit" trademark by Cable Electric Products, Inc. here.

Each 1-ft. section mates with the next. Just start from an existing wall receptacle and add sections around the wall, placing outlets where they are needed.

There are five units in the Inter-Link line . . . there is either 1) a straight cap available or 2) an angle cap available, for plugging into the wall outlet, 3) a rigid link for the straight run along the wall or baseboard, 4) a flexible link for going around corners or doors, and 5) a three-receptacle outlet section.

## Hose Elbow Fittings Simplify Installation

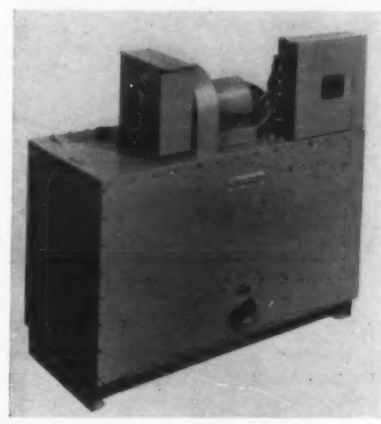
—KEY NO. G-8115—




JACKSON, Mich. — Hose elbow fittings that simplify hose installation in confined spaces and reduce the number of joints and fittings required have been developed by Aeroquip Corp. here.

Chief advantages claimed for the new elbow fittings are less flow restriction, greater space-saving, and reusability of the fittings. By reducing the number of joints in an installation, possible points of leakage are also eliminated, according to Aeroquip.

## Dryomatic Unit for Commercial, Industrial Uses



—KEY NO. G-8116—

ALEXANDRIA, Va. — Development of a new commercial-industrial dehumidifier suitable for low humidity storage and processing applications was recently announced here by Dryomatic Corp.

Model 105 is an automatically regulated dual-tower unit which uses silica gel as its drying medium. It is designed primarily as a space dryer to maintain humidities down to 10% in areas up to 35,000 cu. ft. over a wide range of temperatures. It will also provide low dewpoint air for processing applications and can be used either alone or in combination with cooling equipment in comfort conditioning systems, it was pointed out.

The machine has a dry air output of 100 c.f.m. and is capable of removing 50 lbs. of water per 24 hours.

Regeneration of the silica gel is accomplished automatically by electric heating elements. While one tower thus renews itself, the other continues to supply dry air into the area.

**For additional information on any of these products please use "Information Center" blank on page 22. Refer to item interested in by Key Number, which accompanies each article.**

## Worthington Offers Air-Cooled Package

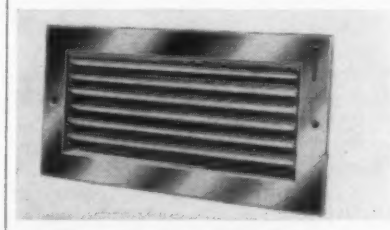
—KEY NO. G-8117—

HARRISON, N. J.—A new air-cooled packaged air conditioning unit for commercial applications, known as the "SAC," specifically designed to work solely as an air-cooled unit, has been announced by Worthington Corp.

Manufactured at the Decatur, Ala. plant, the unit is equipped with a specially designed hermetic air-cooled compressor that eliminates the need for conversion; an air-cooled weather-proofed condenser with high capacity blower and motor; life-time lubricated bearings on the fan and fan motor; and an automatic switch for correct temperature control, the company explained.

SAC units are internally wired at the factory and are available to operate on 208, 220, 440, or 550 v. a.c. current.

Optional accessories include discharge plenum with adjustable grille louvers; hot water or steam, or non-freeze steam two-row heating coils; and water spray type humidifier.



## Grille Designed for Heating and Cooling

—KEY NO. G-8118—

WATERLOO, Iowa — A new type grille designed to replace stamped registers when converting warm air systems to add summer air conditioning has been announced by Titus Mfg. Corp.

Called the "Converti-Grille," this product provides the correct air patterns necessary for both winter heating and summer cooling, it was noted.

Simply position fully adjustable, gang operated louvers upward to get correct air pattern for cooling —adjust louvers downward for correct horizontal heating pattern. There is a built-in, single valve damper operated from face of grille. Heavy-duty sponge rubber gasket assures air tight seal.

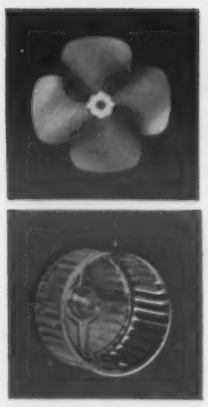
## Crane Offers New Line Of Unit Heaters

—KEY NO. G-8119—

CHICAGO—A new line of Crane Co. unit heaters for commercial and industrial applications has been announced.

New Crane "Sunnyaire" heaters are available in either hot water, steam, or gas-fired versions. Heaters using hot water or steam are furnished in two models: Type H for horizontal installation, and type HV for either vertical or horizontal installation.

NEW & NEW EQUAL NEWS



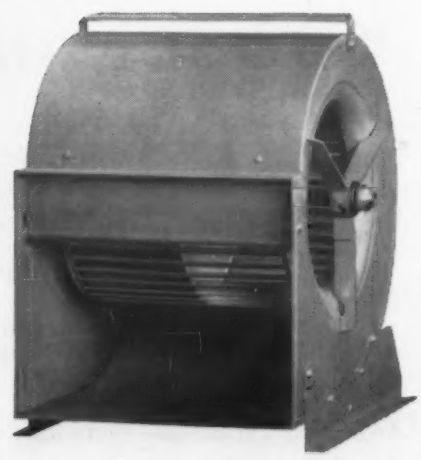
It's the *new* Torrington line of Vari-Basic blower units for central heating and air conditioning equipment, now in production at all three Torrington plants. And here is why this important product development is *news*.

**1.** New quality: Engineering features include the famous Center-Lock Airotor wheel design . . . permanently lubricated bearings, with 3-point suspension . . . and spot-welded heavy steel construction, superbly finished.

**2.** New flexibility: The units are designed for interchangeability with existing standard equipment, and Torrington's marketing policy makes these components available singly or in combination.

**3.** New versatility: These units are available in a wide range of sizes designed to provide maximum variability to meet directional-flow requirements.

Your inquiries are invited. For full information, *talk to Torrington!*



THE TORRINGTON MANUFACTURING COMPANY

TORRINGTON, CONNECTICUT • VAN NUYS, CALIFORNIA • OAKVILLE, ONTARIO

# Now Representing...

**Marlo Coil Co.**—The newly-formed P & E SALES ASSOCIATES, with offices in East Orange, N. J. and Port Chester, N. Y., has been appointed representative in northern New Jersey and seven suburban counties of New York. James Z. Peepas will head the office in East Orange and Paul E. Evans the office at Port Chester. Both have been associated with Buffalo Forge Co.

**Recold Corp.**—CHARLES W. HANSON of Miami, Fla. will represent Recold products throughout Florida. A manufacturers' agent since May, 1957, Hanson was formerly sales manager for Joe E. Parker Co., Atlanta, for seven years.

**Vending Machine Div., La Crosse Cooler Co.**—HUTSON SUPPLY CO., Minneapolis, will assume full responsibility for contacting all bottler accounts in Minnesota, North Dakota, and South Dakota.

**Kelvinator Div., American Motors Corp.**—MILLS-MORRIS CO., INC., Memphis, has been franchised to distribute Kelvinator and Leonard home appliances in western Tennessee, northercn Mississippi, and certain bordering counties of Arkansas, Kentucky, and Missouri. Arthur Fulmer, Inc., former Memphis distributor for Kelvinator and Leonard, is discontinuing its appliance department.

**Lord & Palmer, Inc.** (Belding, Mich.)—E. E. SOUTHER IRON CO., St. Louis, has been named distributor of "Mercury" commercial and residential air conditioning. It will service dealers in eastern Missouri and southern Illinois.

**General Electric Co.**—WEBER AIR CONDITIONING CO., Pittsburgh, was named distributor for western Pennsylvania and the Tri-State area for commercial and industrial air conditioners.

**Novi Equipment Co.** (Novi, Mich.)—ENGINE EXCHANGE, INC., Columbus, Ohio, was appointed authorized distributor and installation center for Novi automobile air conditioners in central Ohio.

**Fan & Blower Div., Peerless Electric Co.** (Warren, Ohio)—NORMAN S. WRIGHT & CO., with offices in San Francisco, Sacramento, Los Angeles, Fresno, Seattle, Spokane, Portland, and Phoenix has been appointed western sales representative.

**William Wallace Co.** (Belmont, Calif.) — This manufacturer of "Metalbestos" gas vent pipe has appointed HENRY W. LOCKE sales representative in New Mexico. He will headquarter in Albuquerque.

**Trion, Inc.** — NORMAN S. WRIGHT & CO., Phoenix, Ariz., has been appointed representative for commercial and industrial electronic air cleaning units.

**Cincinnati Sub-Zero Products**—This maker of low temperature industrial chilling machines has appointed ACE REFRIGERATION SUPPLIES CO., INC., Miami, Fla., as sales representative, serving south Florida.

**Refrigeration Div., McIntire Co.** (Livingston, N. J.)—W. B. KNOX & ASSOCIATES, Atlanta, will cover North and South Carolina, Tennessee, Georgia, Alabama, Florida, and Mississippi for the firm. JACK HUFF will now cover Virginia in addition to Maryland, Delaware, eastern Pennsylvania, southern New Jersey, and Washington, D. C. CHARLIE WACHHOLTZ will add Louisiana to his present states of Texas, Arkansas, and Oklahoma. R. D. HOLLINGSWORTH will also cover West Virginia in addition to Michigan, Kentucky, Ohio, and western Pennsylvania.

**Dean Products, Inc.**—J. C. BATTLES, Crystal Lake, Ill., will represent the firm on its cold plates in areas of Illinois, Iowa, and Wisconsin.

**Ben-Hur Mfg. Co.** (Milwaukee)—Four new distributors have been appointed. PHILLIPS DISTRIBUTING, Stockton, Calif., will handle the central California-Stockton market; NORTH VALLEY DISTRIBUTORS will cover northeastern California working from Chico; WHITEHOUSE APPLIANCES, Eureka, Calif. will service northwestern counties of that state; and FRAKER HEATING & EQUIPMENT CO., Knoxville, Tenn. will handle eastern Tennessee.

**Manitowoc Equipment Works**—Appointment of the following sales representatives has been announced: WILLIAM WILKIN, Milwaukee, for Wisconsin and upper Michigan; ELMER R. CHURCH, Jackson, Mich. for lower Michigan; and GEORGE W. JIGAMIAN, Chicago, for upper Illinois.

**Fine Products Co.** (Berwyn, Ill.)—This distributor of refrigeration equipment and parts has appointed G. DAVID FAIR as territory representative for the southern two thirds of Ohio and Indiana and all of Kentucky. He has established headquarters in Kenton, Ohio.

**Admiral Corp.**—CAPITAL RADIO & TELEVISION CO., Nashville, Tenn. has been appointed distributor to cover middle Tennessee and southern Kentucky. ADMIRAL DISTRIBUTORS - DETROIT DIV. and INDEPENDENT DISTRIBUTORS, INC. of Grand Rapids, Mich. will cover Michigan counties formerly handled in Lansing.

**Astral Industries, Inc.** (Englewood, N. J.)—GOODBINDER ASSOCIATES has been appointed distributor for the Washington, D. C. area for portable gas and electric refrigerators.

## Central System To Cool Fish Memorial Hospital

NEW SMYRNA, Fla.—Work has begun on installation of a $44,255 central air conditioning system at the 30-bed Fish Memorial hospital.

A building to house equipment for the new system is under construction on the hospital grounds.

The air conditioning system is financed by a grant from the Ford Foundation to the Fish Estate, which operates the hospital.

The unit will be large enough to take care of an additional 20 beds if the hospital expands, McGinnis said.

The new unit also can be used for heating.

D. W. Browning & Co., Daytona Beach, was awarded the air conditioning contract after competitive bidding.

**Reprints Available**

Hermetic Compressor Design, Development, by Henri Soumerai. Only 40¢ each.

Mail this ad with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.


Here it is! one of the new Mueller Brass Co. refrigeration products that are out of this world!

the new Safety-master PRESSURE RELIEF VALVE

safety engineered for high volume discharge

New Mueller Brass Co. pressure relief valves provide positive action and high volume discharge. Safety-Masters are built to meet the A.S.A.B. 9 safety code, comply with A.S.M.E. code, and are certified by the National Board. Safety-Masters are available in pressure settings from 150 lbs. to 450 lbs. Settings are factory-accurate and are stamped on the body of the valve. All valves are safety sealed to guarantee maintenance of setting accuracy. In operation, the unique instant action of the valve seat disc relieves pressure without chatter or vibration, and provides complete and positive reseating. Safety-Masters are available in 12 different end connections in straight-through or angle type, and are all made from premium quality brass for superior strength. Every Mueller Brass Co. pressure relief valve is packed in strong metal edge cartons for complete protection until installation. Be sure to specify Safety-Master . . . another new Mueller Brass Co. product that is "out of this world" in design, engineering, and performance.

WRITE TODAY for new product data sheet No. 11

171

MUELLER BRASS CO. PORT HURON 13, MICHIGAN



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Stop ... rust, dirt chlorine taste

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FILTRINE MFG COMPANY

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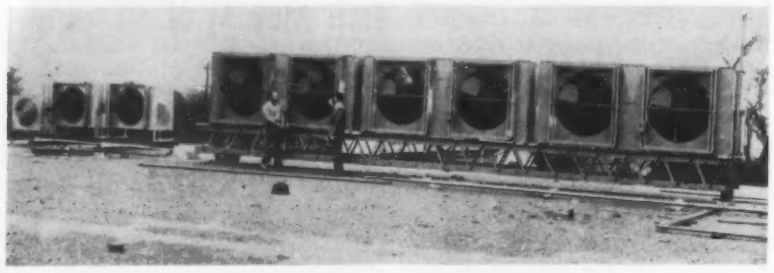
# 9 Unicons on Roof Solve Water Problem for Florida Market



ST. AUGUSTINE, Fla.—When plans were drawn up for the new Setzer Food Store here, owners of the supermarket chain had to contend with king-sized air conditioning and refrigeration problems.

The installation called for a 70-ton air conditioning load, with high water costs as one of the major factors.

R. B. Cortedallas, supervisor of construction for the Setzer Stores, found the answer to the problem in the Kramer Trenton "Unicon" air-cooled condenser. Use of the Unicon condensers was recommended to Cortedallas by Paul E. Stewart, vice president and manager of the Refrigeration Supply Co., Jacksonville, Fla.

Refrigeration Supply engineers specified the use of six Unicons, which were mounted on the roof of the new supermarket. Two model BD4200 and one model BD3200 Unicons handle 70 tons of air conditioning on three circuits, two of 25 tons each and one of 20 tons. Kramer "Winterstats," which are designed to maintain proper head pressure in the winter months, are used on each circuit.

In addition, three small Unicons are used at the new store to handle the refrigeration load. A BD1000 is used on a 36-ft. dairy case of triple deck design employing a 7½-hp. compressor. A BL750 is used on three 0° frozen food cases on a 5-hp. compressor.

All of the Unicons are mounted on the roof for maximum cooling capacity.

## *Calif. Lets Engineers Use Mechanics Lien Law*

SAN FRANCISCO—Registered engineers and licensed land surveyors will be privileged to use California's mechanics lien law beginning Sept. 11.

Gov. Goodwin J. Knight has signed Senate Bill 389 amending Section 1181 of the code of civil procedure. The amendment was sought by Consulting Engineers Association of California, according to Pecos H. Calahan, executive secretary.

## *University of Chicago Opens Cryogenic Lab*

CHICAGO—The Institute for Metals of the University of Chicago recently opened a $440,000 laboratory with facilities for freezing anything solid in a few seconds.

University and industry scientists will use the laboratory for studies of the reactions of atoms and molecules at temperatures near absolute zero—minus 460° F.

## Now to Work

SAVANNAH, Ga. — Nettle's Refrigeration Co., Savannah's newest Carrier air conditioning dealer, held open house at East Broad and Seiler Ave.

## New Cabinets Boost Ice Cream Sales 25%

PEORIA, Ill.—One of the largest installations of Anheuser-Busch's new model AD 18-7 refrigerated cabinet was recently completed at Vogel's Market—one of the biggest self-service markets in the Pekin-Peoria area, it was reported.

"Since the installation of the four AD 18-7's, our ice cream sales have increased by about 25%, and we expect the upward trend to continue as warm weather brings an increase in ice cream consumption," said Virgil Vogel, owner of the market.

Vogel's ice cream department was recently revamped, the owner said, to sustain the modernization of the store. In addition to the installation of the four Anheuser-Busch cabinets, two shelves were erected over the cabinet, where high-profit tie-in articles are displayed.

The model AD 18-7 has a capacity of 18 cu. ft., and is 84 in. long, 33 11/16 in. wide, and 45½ in. high. It has an inclined glass front, interior lighting, full-length flavor-strip moulding, an all-metal front, and a night cover.

## Pooler Honored for Apprenticeship Work In San Diego County

SAN FRANCISCO — Arthur Pooler, Sr., of San Diego has been given a meritorious service award for his work on the joint apprenticeship committee for refrigeration and air conditioning in San Diego County.

The award was conferred by the California Apprenticeship Council which meets every quarter and is made up of management and labor representatives and certain state officials.

### Form New Firm

LA CROSSE, Wis.—Roellig's, Inc. has been formed here, with an authorized capital stock of 1,250 shares of common of no par value, "to manufacture and deal in refrigeration equipment, air conditioning and heating equipment, etc." Incorporation papers were signed by A. W. Roellig, Jr.

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insist on THERMOPANE® INSULATING GLASS!

Customers see their favorite brands faster

*(and from farther away)* . . .

through this glass

that stays clear!

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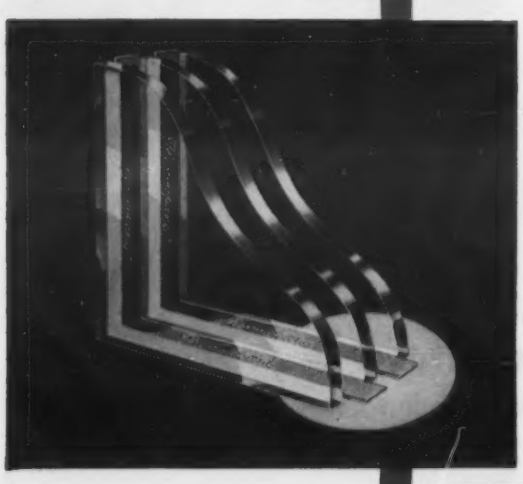
*Thermopane* insulating glass is warranted against obstruction of vision due to film formation or dust collection between the panes. More than 7,000,000 units warranted to date. For your own protection, insist on *Thermopane.*



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- **taking on new lines—**

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**CLASSIFIED ADS**
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*For more information about products advertised on this page use Information Center, page 22.*

## *Wholesaler Switches To Self-Service In New, Windowless Office-Warehouse*

READY FOR BUSINESS is air conditioned self-service sales floor in new windowless home of Refrigeration Distributors Corp., Salt Lake City.

SALT LAKE CITY — Refrigeration Distributors Corp., local air conditioning, refrigeration, heating, and ventilating distributor, has transferred its operation into a new combination sales-office-warehouse which was designed and built for that specific use.

The building, which has 14,260 sq. ft. of floor space, is divided into three sections: 2,520 sq. ft. for offices, 3,340 sq. ft. for sales and display, and 8,400 sq. ft. for warehouse storage.

### 2 COMPLETE SYSTEMS

Two complete heating and air conditioning systems were installed in the building which is also devoid of windows. A 10-ton combination system conditions the sales and display areas of the building. This system operates with a constant supply of fresh air.

The mezzanine office space is conditioned year around by a General Electric "Weathertron" heat pump situated in the display area with the cabinet front replaced by a plastic window so visitors can view the workings of the machine.

### SELF-SERVICE

A new service offered by Re-Strib-Co is self-service merchandising. There is also two level loading at the truck dock. The 24-in. high dock at the side of the building permits customers to call for equipment with pick-up and panel trucks.

In addition, there is a 42-in. high dock at the rear of the structure. This dock is capable of handling the largest stake-bed and van type trucks.

Ample parking facilities are another convenience. These include a customer parking area in front of the building plus a large paved lot at the rear.

At an open house held to celebrate their move, Re-Strib-Co's employes and management were hosts to area refrigeration contractors, architects, and engineers.

Also on hand were representatives of the manufacturers whose products are distributed through Re-Strib-Co.

## M-H Buys Raytheon's 40% Stock Interest In Datamatic Corp.

BOSTON — Minneapolis-Honeywell Regulator Co. has purchased from Raytheon Mfg. Co. for $4,500,000 the latter's 40% stock interest in Datamatic Corp., it was announced here jointly by Paul B. Wishart, president of Minneapolis-Honeywell, and Charles F. Adams, president of Raytheon.

Datamatic Corp. was organized jointly by Minneapolis-Honeywell and Raytheon in 1955 to engage in the development of large-capacity high-speed electronic digital data-processing systems for office and business use. Wishart said that, with the purchase of Raytheon's 40% interest, Minneapolis-Honeywell now owns all the outstanding stock in Datamatic.

## *Christian Sheet Metal Licensed To Make Duc-Pac Trunk, Stack Ducts*

EAST LONGMEADOW, Mass. —Duc-Pac, Inc., maker of prefabricated duct and fittings, has licensed Christians Sheet Metal Works, Spencer, Iowa to manufacture Duc-Pac trunk and stack duct.

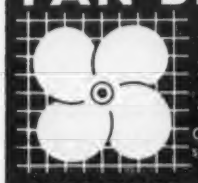
Commenting on the arrangement, Russell Sweet, president of Duc-Pac, pointed out that Christians has been operating in the town of Spencer for over 30 years, and has been active in all phases of sheet metal work and warm air heating. During 1947, a plant was erected in Spencer to enable Christians to enter the manufacturing field. James W. Christians, son of the founder, the late U. W. Christians, is manager.

According to Sweet, Christians has been licensed to make only the heavier Duc-Pac units. The Duc-Pac plant in Massachusetts will supply the packaged fittings to Christians who will, in turn, distribute the complete Duc-Pac line to jobbers for resale to the trade in the Iowa area.

Earlier this year, Duc-Pac licensed the Aero Tool Works, of Toronto, under a similar plan, to cover Canadian distribution of Duc-Pac products. Christians, however, is the first manufacturer in this country to be so licensed. It is understood that Duc-Pac shortly plans to extend this licensing agreement to a limited number of other manu- in the United States.

It is expected that this expansion of production facilities will broaden substantially distribution of the Duc-Pac lines.

FAN BLADES



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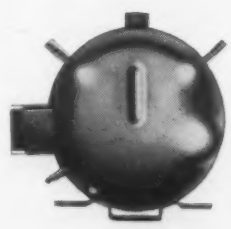
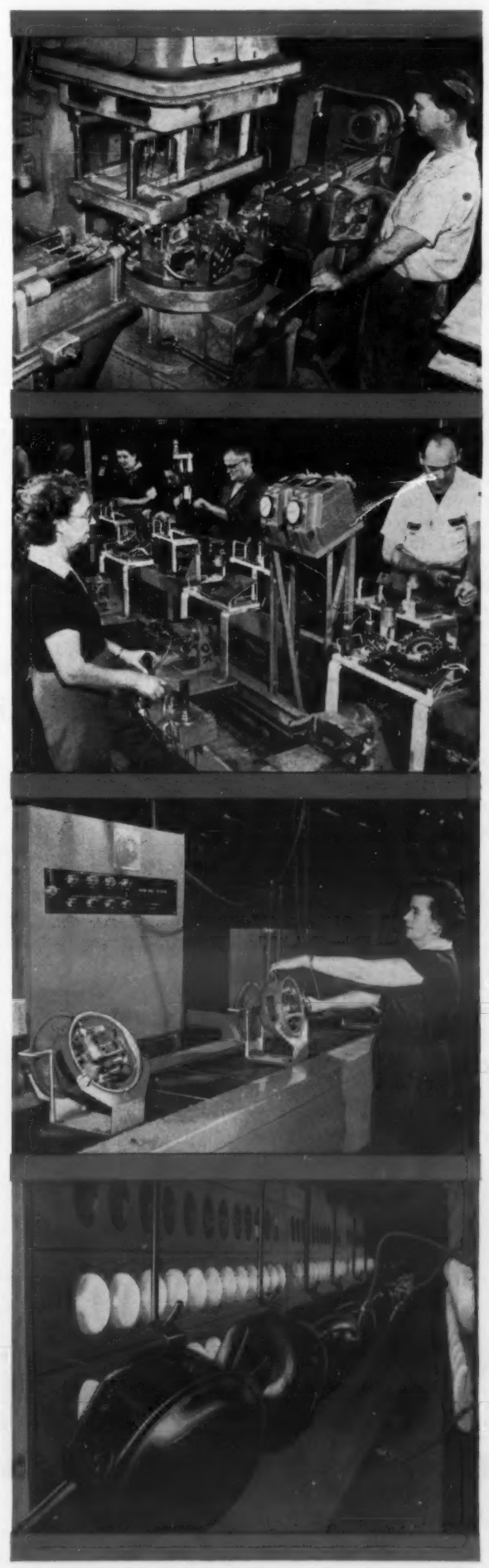
TO SERVE YOU BETTER!

Kelvinator's new hermetic production facilities now make available new "SPACE-SAVER" COMPRESSORS built to highest standards of quality, to give you superior performance at competitive prices —*in even greater volume*



New "Space-Saver" hermetics, only 10 11/32" high x 11 3/8" wide x 6 1/4" deep, are truly compact, top quality compressors. They already have thoroughly demonstrated their excellent performance in many applications. Light in weight, low in cost, they are available in natural or forced convection models.



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# What's Going On in HEATING

*News of Methods, Products, People*

### *Collector Wall Absorbs Sun's Rays*

ACTING AS A GIGANTIC collector surface, this wall transfers heat from sun to water circulating through channels in the collector plate. Heated water is used for heating the building or is stored for later use.

## Solar Heating Passes First Winter's Test In Albuquerque Building

SAN FRANCISCO—What is believed to be the first commercial building in the U. S.—and possibly in the world—to utilize radiation from the sun as a primary source of heat during cold weather has been operated successfully through the major part of its first winter, it was reported.

The structure in Albuquerque, N. M. is home office for F. H. Bridgers and D. D. Paxton, consulting engineers, who together with Roger W. Haines described their first winter's experience in the building to a meeting of the American Society of Mechanical Engineers here.

One wall of the building acts as a gigantic collector surface. It is a south-facing flat-plate which absorbs heat from the sun and transfers it to water circulating through channels in the collector plate. The water is then carried to interior areas for heating or stored in a 6,000-gal. underground tank and used as needed to warm the building.

In summer, primary cooling source is a Marlo evaporative cooler which provides chilled water for the comfort conditioning system. During periods of unusually high heat loads, the cooling function is supplemented by a heat pump, with the Marlo unit also acting as a cooling tower, it was indicated. This same heat pump is used as an auxiliary heat supply in winter when solar radiation is insufficient.

The engineers told the meeting "the system has performed satisfactorily through the worst part of the winter, including a much cloudier than normal January."

## Misuse of AGA Seal Costs Manufacturer $10,000 In Fines

NEW YORK CITY—A Federal Court decision penalizing a California manufacturer of water heaters for unauthorized use of the American Gas Association "Seal of Approval" has been hailed by the AGA as "a clear-cut precedent which will mean continued protection for the gas industry's coveted 'Blue Star' approval seal granted to appliances which meet rigid standards of performance."

Judson J. Whitehead, Jr., Oakland, Calif., was fined $5,000 and two firms he has headed—the Jud Whitehead Heater Co. and the Hynes & Cox Electric Corp.—were fined $2,500 each by Federal Judge Oliver J. Carter in the U. S. District Court in San Francisco for violating a permanent injunction issued in 1953, according to the AGA. Judge Carter warned that further violations will result in imprisonment.

Action was instituted against Whitehead in 1953 on grounds that he had used the AGA Seal of Approval on gas appliances which had not been approved by AGA.

This resulted in a permanent injunction being issued against Whitehead on Dec. 9, 1953. AGA subsequently contended the injunction was not being observed and that Whitehead and his companies should be cited for contempt of court. Approximately three years of litigation ensued, culminating in the $10,000 in fines imposed by Judge Carter last June 28.

Citing the "evasive misleading nature" of Whitehead's testimony in the proceedings, Judge Carter also turned down the defendants application for future use of the AGA Seal of Approval.

### Air Conditioning Paves Way for

## *Electric Heating In Homes*

EVANSVILLE, Ind.—Electrical heating of homes in conjunction with electricity for comfort cooling will, in future years, become quite universal, according to W. L. Thompson, manager, Radiant Heater Div., Edwin L. Wiegand Co., producer of "Chromalox" heating elements.

At a meeting of the Evansville Section of the American Society of Refrigerating Engineers, Thompson spoke on "Creating the Electric Comfort Environment."

He traced the history of the Wiegand company back 35 years when it first sold electric strip heaters to the Pittsburgh steel mills for use in comfort heating crane cabs. Some of these are still in use today, he said.

Thompson asserted that the electric heating industry and the power companies are grateful to the refrigerating and air conditioning industries for their part in developing the general and widespread use of electricity in the American home.

About 30,000 new homes this year will be heated electrically, he estimated, with over 500,000 others already so equipped.

Thompson said he believes that the most efficient electrical home heating system is one which applies heat at the greatest heat loss sources, namely windows. By applying a combination heating and cooling system at or below windows, year-round comfort can be efficiently and economically maintained, he stated.

Thompson said that heating schools electrically has already been started and offers a new horizon in modern engineering. This, coupled with air conditioning, can form a balanced electrical load for year-round school operation, he indicated.

## Holland Furnace Loses License In Columbus

COLUMBUS, Ohio—The furnace installation license of Holland Furnace Co. here was ordered revoked recently during a city investigation.

The order was issued by assistant safety director William L. Lehman at a hearing in his office.

Shortly thereafter, the Franklin County building department announced that it, too, would issue no more permits to representatives of the firm.

Several residents complained that they had been pressured into buying new furnaces that were not needed. Lehman said company agents had told residents there was danger of monoxide fumes, when the furnace was actually performing all right.

"This is an outright lead-pipe racket, and you're not going to operate here if we can help it," Lehman declared.

Present at the hearing were Charles C. Bowlin and Al D. Fabrizo, co-operators of the firm, and two men who, Lehman charged, passed themselves off as engineers when they were only salesmen.

Bowlin denied knowledge of any pressure tactics and said if any were proven true, he would make it up to residents.

## Pataky Directs Sales For Norman Products

COLUMBUS, Ohio—Henry R. Pataky has been named director of sales for Norman Products Co. here.

Pataky is well known in the heating and air conditioning field, having started in this business in 1931. He has served in many capacities from salesman to sales director of companies in the industry.

At Norman Products, Pataky will be in charge of sales for all products manufactured by the company including two new developments, the schoolroom heating and ventilating system and the new "Three-Sixty" overhead heating unit with Norman's patented sealed-combustion system, it was pointed out by the firm.

Norman Products also manufactures horizontal furnaces; residential, commercial, and industrial conversion burners; duct furnaces; and blower filter units.


## Let MEIER Props Help YOU keep mounting Production Costs in Line

If you manufacture products involving air movement, chances are MEIER can help cut *your* increasing production costs.

After all, we've been in the fan blade business a long, long time. And, down through the years, we've accumulated quite a collection of standard parts which offer thousands and thousands of combinations which may be applicable to your needs. And, at less cost to you!

You simply ask for a blade to do a job, and we'll take it from there.

Meier Electric & Machine Company, Inc. offers you over 50 years of experience, plus the scientific and technical know-how and equipment necessary to provide you with the correct propeller for *your* product. With this background of experience—coupled with continuous scientific research, modern production and technical facilities—we're in a wonderful position to serve both large and small manufacturers of products involving air movement. Try MEIER.

Let MEIER's direct factory representative tell you about the many thousands of possible combinations from these standard components.

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**VIA NAVL-CRESTON PADDED VANS**

**A BETTER DEAL FOR**
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*For more information about products advertised on this page use Information Center, page 22.*

# Heating Men Urged To Loosen Lips, 'Let Public Know What We Can Do!'

SAN FRANCISCO—"One of the main things we have to do is to let the public know what we can do."

James F. Deane, general chairman of the summer convention held here recently by the National Warm Air Heating & Air Conditioning Association and cooperating groups, made this point at a press conference preceding the meeting.

The convention was staged by NWAHACA in cooperation with the Institute of Heating & Air Conditioning Industries of Southern California, the Warm Air Heating Institute of Northern California, and the Portland (Ore.) Warm Air Heating & Air Conditioning Association.

Deane is a trustee of the NWAHACA, vice president of WAHINC, and vice president and general manager of Tuck-Aire Furnace Co., San Francisco. At the press conference, he stated that the industry is strong in California with 40 manufacturers making furnaces and air conditioning units worth $100 million a year, over 30% of the national output.

### WE NOW MAKE HOMES COMFORTABLE

Deane said, "we are now able to make a home comfortable. I have in my own home the perimeter system.

"One of the main things we have to do is to let the public know what we can do. Our industry has been derelict in its duty. If we let them know what we can do then we will start to do our job.

"We are beginning to open our minds a little bit. We are beginning to open our mouths a little bit. Let the public know so they can demand the job we can do for them."

George Boeddener, managing director of NWAHACA, said the association was nationally organized 44 years ago, which makes it one of the oldest trade associations.

### PUT WARM AIR AGAINST WINDOWS

"Put the warm air against the windows with the perimeter system," Boeddener said, reminding those at the conference they don't have severe conditions on the coast where design temperatures are 35°, compared with zero in the east.

Dar Knowles said WAHINC started at the contractor level in April, 1956, and has expanded to include manufacturers and wholesalers, with a "stamp plan" financing a campaign to tell the public what they can expect from warm air heating.

Gordon Payne of Los Angeles, who is president of Heating & Air Conditioning Contractors Association of Southern California, and who helped put together the group that formed the Institute of Heating & Air Conditioning Industries of Southern California, reported:

"We are considering in the institute at the present time having a field man to obtain uniformity in heating codes, which will be a forward step."

Donald Keefer said the Portland WAHACA is an organization of dealers and suppliers. Their association activities have been with building codes, expanding public relations and promotion activities, and representing the industry in labor relations.

Rudie Harkens, managing director for IHACISC, said the practical side of developments is that contractors, manufacturers, and suppliers in California are apparently coming awake to their opportunity.

Trying to find the right man for a hard-to-fill vacancy—the NEWS' Classified Ads are read by your man.

*Place your ad today!*

## *Esso Fuel Price Drop Cancels Recent Boost*

NEW YORK CITY — Esso Standard Oil Co. has reduced its prices on home heating fuel, kerosene, and diesel fuel in its 18-state marketing area.

Ranging from two-tenths of a cent to four-tenths of a cent per gallon, the decreases, in effect, cancel industry-wide increases put into effect recently.

## Detroiters Frolic Aug. 8

DETROIT — The Detroit Warm Air Heating Association will hold its annual heating industry outing Aug. 8, at the Hillcrest Golf & Country Club in nearby Mt. Clemens.

# New Tri-State Plumbing Supply Takes Over W. M. Johnson Co.

HUNTINGTON, W. Va.—The wholesale plumbing and heating equipment business of W. M. Johnson Co. has been purchased by Tri-State Plumbing Supply Co., Inc., it was announced.

Tri-State Plumbing will lease the Johnson properties at 622-32 8th Ave. in Huntington and make its headquarters at this address. Employes of both firms will be retained by the new organization, according to H. L. Godschalk, president of Tri-State, and Wiley M. Johnson, president and founder of the company bearing his name.

Tri-State Plumbing was formed recently for the purpose of acquiring the Johnson business.

The company will continue to stock and distribute plumbing and heating equipment, pipe, valves, fittings, water heaters, and other supplies to the plumbing and heating trades in the Tri-State area of West Virginia, Kentucky, and Ohio. A number of special services will be offered customers, including merchandising, estimating, and engineering assistance, Godschalk stated.

The company has begun an ambitious expansion program which includes addition of a number of new equipment lines and extensive sales promotion activities. They have been named exclusive distributor in their area for John Wood gas and electric water heaters and "Fluid Heat" heating equipment.

Johnson has announced his retirement from active business to pursue various outside interests.

WAGNER ELECTRIC MOTORS...THE CHOICE OF LEADERS IN INDUSTRY

National Home Office of the Allstate Insurance Company.

**Wagner Motors help B & G Pumps meet their toughest test... QUIET OPERATION!**

Circulating pumps used in hot water heating systems must be silent—vibrationless in operation, since they are the connecting links between the boiler room and the structure itself. A prime requirement for quiet pump operation is an electric motor that operates almost silently, yet has plenty of stamina to hold up under years of hard, steady operation.

That's why Bell & Gossett Company used Wagner Motors on the Universal Pumps in the Allstate Insurance Company home office. These quiet-type motors are known for smooth balance and quiet operation.

Perhaps you have a specialized motor application . . . if so, remember, there's a Wagner motor to fit every need . . . a complete line for all current specifications with a wide variety of enclosure types and mountings.

Your nearby Wagner engineer can help you select the *right* motor to meet your specifications. Call the nearest of our 32 branch offices or write us.



Standard resilient mounted Wagner Motors, up through 5 hp, can be used for special applications where extremely quiet operation is demanded. Sleeve or ball bearings.

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# Winter Air Conditioning Fundamentals

## *Heating Commercial, Industrial Buildings With Automatic Gas Unit Heaters*

***By H. C. Gurney, Janitrol Div., Surface Combustion Corp.***

The gas unit heater is a completely automatic self-contained gas-fired heating plant. It is designed for ceiling suspension or floor mounting, either within the space to be heated or in close proximity to it. Since the heat is generated within the unit itself there are no large transmission or radiation losses.

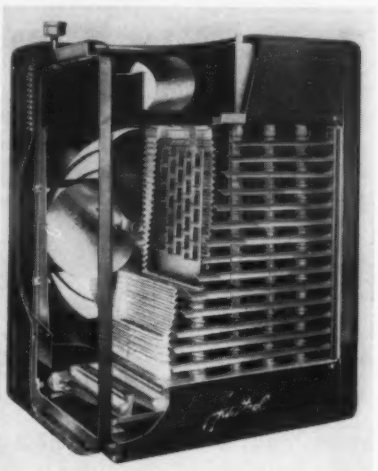

FIG. 1—Suspended Type with Propeller Fan.

### PRINCIPLES OF OPERATION

The unit heater warms and mechanically circulates large volumes of air within the space to be heated. A fan or blower draws in the air, forces it over a compact heat exchanger where it is warmed and then discharges it through an adjustable diffuser-type outlet.

With suspended type unit heaters, the outlet louvers direct the warm air downward towards the floor areas, causing a rapid mixing of the warmed air with the cooler air of the room.

Suspended type heaters with return air ducts or floor type unit heaters heat by displacement. They pick up the cooler air at floor level and discharge the warm air horizontally above head level.

### WHAT IT REQUIRES

The gas unit heater requires:

Minimum installation space, overhead or on the floor.

Supply of natural, manufactured, mixed, or liquified petroleum gas.

Gas piping to individual units.

Electrical connections to individual units. (All except the larger units are arranged for operation of 110-volt lighting circuit.)

Vent to the outside.

### WHERE IT IS BEST USED

The gas-fired unit heater is especially adapted to the complete heating of commercial establishments such as wholesale or retail stores and shops, eating and drinking places, recreation centers, sales rooms, offices, auditoriums, garages, and warehouses.

In industrial applications the gas-fired unit heater is especially adapted:

1. For complete heating of factories, mills, warehouses, and foundries.

2. For spot heating within factories, mills, warehouses, and foundries. For auxiliary heating where seasonal or departmental requirements would otherwise require use of a large central plant at a small percentage of rating.

3. To supplement an inadequate central heating system in factories, mills, warehouses, etc.

In addition to those uses mentioned above, unit heaters provide an ideal heating system in old buildings where the entire heating plant needs replacement, and in new additions to old buildings where the expansion of the existing plant is impractical either because of capacity or construction costs.

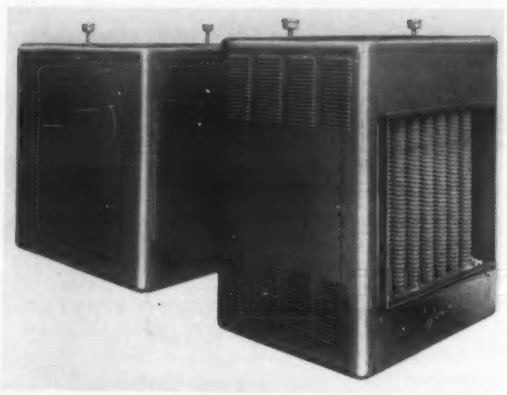

FIG. 2—Suspended Type with Centrifugal Multi-Blade Blower.

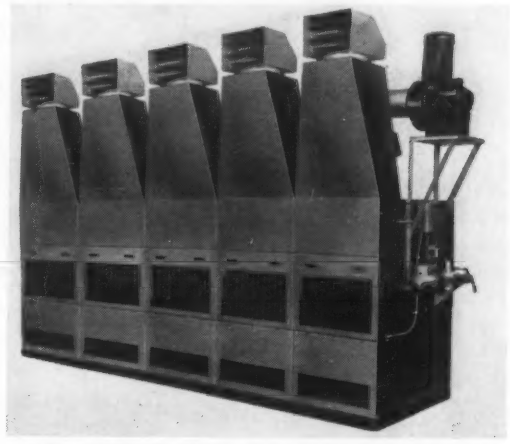

FIG. 4—Heavy Duty, Floor Type Unit Heaters

It also is an ideal heating system in those rented commercial buildings where the tenant is required to furnish heat.

Standard units heaters should not be installed in spaces where combustible atmospheric gases or dusts are present: paint spray departments, dry cleaning plants.

However, they may be used to heat such spaces provided that the heater is in a completely separate area, drawing uncontaminated combustion air from the installation area only.

The ventilating air to be heated must not be recirculated from areas containing contaminated or dangerous atmospheres. The warm air is carried to the space to be heated by means of ducts. Local codes should be investigated.

### WHAT IT PROVIDES

Means for eliminating central heating and attendant costs.

Minimum installation space requirement.

Automatic uniform heating.

Low original cost, low maintenance.

Elimination of fuel storage.

Rapid response to changes in heating requirements.

Departmentalized (zone) control.

Economical heating.

Clean heat.

### TYPES

Four types of unit heaters are described below and pictured on this page.

### SUSPENDED TYPE WITH PROPELLER FAN

The suspended type gas unit heater is designed to deliver warm air at sufficient velocity to penetrate the blanket of cool air which lies on the floor and to warm it by turbulence or mixing.

This type of unit will raise the temperature of the air approximately 55° as it passes through the unit.

The effective heating range of this type of unit is as much as 30 to 35 ft. for the smaller units, and up to 65 or 70 ft. for the larger units when mounted with the bottom of the unit approximately 8 ft. above the floor.

Where reduced fan speeds are used on the larger units, the heat throw is reduced 15 to 20 ft. When practical the air stream should be directed parallel to or at a slight angle away from primary sources of heat loss.

The units should be hung as low as it practical. The higher the units are suspended the sharper must be the angle of deflection to force the air to the floor, hence the shorter will be the effective heating range.

These units are designed primarily for free air circulation, although it is permissible to attach to the face of the unit a short duct sized to the unit outlet for the purpose of heating a small room adjacent to the main space.

In the cut-away view of the propeller type unit heater (Fig. 1), the burners are seen below, positioned beneath the heat exchanger tubes. The buffer, inside the tube, deflects the hot gases against the entire surface to obtain higher efficiency.

Products of combustion are exhausted through the draft hood at the top. The large capacity fan circulates room air across the heat exchanger tubes and projects it through directional louvers to the area to be heated.

### SUSPENDED-TYPE UNIT HEATER WITH CENTRIFUGAL MULTI-BLADE BLOWER

Blower units (Fig. 2) operate on the same principle as the propeller type but have several additional advantages.

With a multi-blade blower, air can be delivered against greater static resistances, permitting the use of ducts.

Also, the blower makes possible a greater effective heating range when the area of the outlet nozzle is reduced and the blower adjusted to increase the outlet air velocity.

The larger units of this type are widely used in large factory heating applications because of their excellent heating performance and their rugged construction and easy maintenance.

Extensive supply and return duct systems can be attached to blower type units when that type of heat distribution system is required.

A further advantage of the blower type unit is that a specified volume of air can be handled more quietly than is possible with a propeller fan.

### COMMERCIAL FLOOR-TYPE BLOWER UNIT

This unit (Fig. 3) which stands on the floor is designed to draw the cooler air from the floor, then heat it and discharge it horizontally overhead.

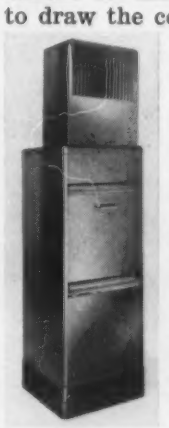

FIG. 3

The heated air is forced to the floor by displacement. This method of heating tends to maintain a lower temperature difference from floor to ceiling, avoids the possibility of blowing warm air blasts directly on any of the occupants and results in a warmer floor condition.

It is quiet in operation and is particularly suitable for use in such places as offices, restaurants, cocktail lounges, drugstores, lodge and club rooms, and various kinds of shops.

The floor type of unit heater is available with a discharge nozzle or diffuser, or it may be attached to a duct system. It is available with filters and is recommended where atmospheric dust and dirt must be kept to a minimum. It may be equipped with a humidifier.

### HEAVY-DUTY (FLOOR-TYPE) UNIT HEATERS

These units (Fig. 4) which stand on the floor are designed for heating of large industrial spaces and are particularly advantageous in buildings with unusually high ceilings or roofs.

They are equipped with multi-bladed blowers. Floor space requirements with respect to heating capacity are considerably less than those of other types of equipment.

They draw the cool air off the floor, warm it through a temperature rise of 70° to 120° F. above inlet temperature and blow it out overhead at a high velocity.

Depending on the type and size, these units have an effective heating range of 80 to 250 ft. when equipped with discharge nozzles. Where conditions make it desirable, they may be connected to duct systems.

## Form Radiant Heating, Cooling Institute

LOS ANGELES — Formation of the Radiant Heating & Cooling Institute has been announced by George Rusher, president of the group.

With a membership composed of licensed radiant heating contractors and engineers, the institute will offer information and assistance to architects, builders, and affiliated groups in the construction field, it was stated.

Other institute officers are Harry W. Taylor, vice president; Leroy C. Bishop, secretary; and Don Smith, treasurer.

The institute is located in Suite 318, 5657 Wilshire Blvd., Los Angeles 36. The telephone number is WEbster 4-1635.

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*For more information about products advertised on this page use Information Center, page 22.*

# OIL BURNER NOZZLES: *Expert Answers Some Questions*

## *How Do You Determine Air Pattern? What Is Remedy for Pulsation? What Is Proper Setting on Draft? Where Should Spray Pattern Hit?*

DETROIT—"A delayed action oil valve is the best addition you can make to any oil burner units," declared Robert Hundley, of William Steinen Mfg. Co., producer of oil burner nozzles, in addressing a recent meeting of the Detroit Warm Air Heating Association.

Hundley's remark was in regard to coking and formation of varnish in oil burner nozzles, which he said could be partially remedied by reducing the quantity of oil remaining in the nozzle after shut-off.

He mentioned that the Oil Heating Institute is planning to push for OHI approval of oil heating equipment at the manufacturers' level. This action was termed a step in "upgrading" the oil heating industry.

Hundley touched on merchandising aspects of the industry, counseling contractors to "make a comprehensive survey of the job and then be sure the customer's wife is present when the sales presentation is made.

He told the men that they must sell the features of their equipment and installation over that of competition. He stressed the importance of a complete contract that lists all the things the contractor is going to do and all the things the customer is going to do, leaving nothing to be misunderstood or argued later.

Hundley emphasized that a contractor cannot afford to cut prices to meet "shyster" competition. He pointed out the futility of 200 jobs a year with $50 profit. Rather, he stated, do 50 jobs a year with $200 profit.

"Twelve to 15% of you men sitting here tonight will be out of business two years from now," he said. "How many heating contractors do you know of, who have closed up shop and called it quits in the recent past?" he asked the group. "Why? Because they were trying to operate on too close a profit margin."

Turning to the subject of oil heating nozzles, Hundley stated that any of the better makes of nozzles could give good performance for better than ten years without showing any wear, were it not for two uncontrollable factors which reduce the useable life to one to two years.

The factors referred to were: (1) "varnish" accumulation due to the oil "cooking" in the hot nozzle after the unit shuts off; (2) dirt damage, such as clogging of the slots in the mixing chamber of the nozzle, sometimes unavoidable.

When a nozzle loses its efficiency, due to dirt or varnish, he advises throwing it away and installing a new one. He warned the group that eventually a new one would have to be installed; they might just as well do it on the spot and avoid another call.

Hundley's talk was followed by a question-and-answer period, during which he cleared up some problems encountered by the contractors and servicemen.

Q. How do you determine the air pattern of a nozzle in the field?

A. Set the burner out on the floor. Take a draft gauge and wave it across the cone of air. At the center of the cone there should be little or no pressure, with equal pressures showing at all points around the perimeter. This is for the hollow cone type. The solid cone nozzle will give an air pattern uniform all across the cone of air.

Q. What per cent of perfect are nozzles as they come from the factory?

A. They are all good nozzles, checked in No. 2 fuel oil. The angle is 80%, plus or minus 5%.

Q. What do you recommend as a remedy for pulsation?

A. If the droplet of oil goes out too far from the nozzle, try increased pump pressure. This will give better atomization and stabilize the flame front. 100-125 p.s.i. is recommended. If pressure is raised above 125 p.s.i., over-heating of the pump will cause seal trouble.

Q. Will constant ignition overcome pulsation?

A. Constant ignition gives a higher smoke reading but draws the flame back toward the nozzle, stabilizing the flame to some degree.

Q. What is the proper setting on draft?

A. .02 to .03, negative reading, on a draft gauge over the fire. Always take readings in more than one position. Just one reading will often be misleading.

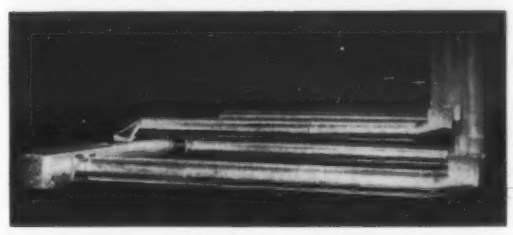
Q. Where should the spray pattern hit in the combustion chamber?

A. Oil should never impinge on the chamber wall.

Q. Is there a difference in nozzles from one manufacturer to another?

A. The difference is very small You have to adjust the air pattern when you install a new nozzle, anyway.

In conversion work, Hundley advised, check the burner and select the combustion chamber design to fit the required air pattern. He cited tests that his firm had made of shapes for combustion chambers. The round chamber was found to be still the best. He said that a pear-shaped combustion chamber was superior to the rectangular-shaped chamber.



SEAL-TITE prefabricated line of duct, pipe, and fittings.

*'Practically' Eliminates Leakage*

## Williamson Offers Prefabricated, Die-Cut Duct, Pipe, and Fittings for Heating, Cooling

CINCINNATI—A prefabricated line of die-cut duct, pipe, and fittings—claimed to be a new concept in design—for heating or cooling has been developed here recently by the Williamson Co.

"Seal-Tite," the company says, "practically eliminates leakage of heat and conditioned air through joints of ducts and fittings."

It is designed for wide adaptability and low-cost installation in every type of home, Williamson added in the announcement.

Tightness of the seamless Seal-Tite fittings in air leakage tests has proved the unit "seals," the manufacturer maintains.

Seal-Tite is said to minimize air turbulence because of its streamlined design and creates a leak-proof system for distribution of heat and conditioned air throughout the home.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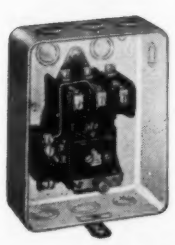

Bulletin 709SP single phase solenoid starter—Size 1.

Bulletin 709 3-phase motor starter —Size 1.

Here are two popular starters for refrigeration motors: the Bulletin 709SP starter for self-starting single phase motors is rated up to 3 hp, 110 v; 5 hp, 220 v; the Bulletin 709 3-phase starter, Size 1 is rated up to 5 hp, 220 v; 7½ hp, 440-550 v. The polyphase starter line goes up in 8 sizes to 300 hp, 220 v; 600 hp, 440-550 v.

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BROOKSIDE CORPORATION
McCordsville, Indiana

# Net Profit Ratio to Sales Drops to 1.2% for 1956, NARDA Reports

## *President Suggests Steps To Help Halt Drop In Dealer Profit*

This yearly Costs-of-Doing-Business Survey conducted by Consulting Economist Richard E. Snyder for the National Appliance & Radio-TV Dealers Association permits dealers in all types of products to compare their operating cost ratios with those of other dealers. Most of the data is presented in tabular form for easy reference.

CHICAGO—An all-time low in profits and a near record high in total operating costs were established by appliance and television retailers in 1956, Ken Stucky, president of the National Appliance & Radio-TV Dealers Association, said in reporting results of the 11th annual NARDA Costs-of-Doing-Business Survey covering last year.

"These findings show a serious threat to the continuance of many needed dealers in this industry as well as most of the marginal ones," he warned.

Highlights of the study, compiled and analyzed for NARDA by Richard E. Snyder, Chicago consulting economist, follow:

The net operating profit ratio dropped to 1.2% of net sales in 1956 from 3.4 in 1955, thus reaching the lowest level in the 11-year history of the NARDA surveys.

Twenty-eight per cent of all dealers reporting for 1956 showed net losses, a new high.

Total costs of goods sold amounted to 67.7% of total sales in 1956, up from 65.7 in 1955.

Total operating costs in 1956 reached 31.1% of net sales, including taxes; in 1955, T.O.C. was 30.9; in 1954, the record of 31.4 was set.

Year-end inventories were up 14.8% in dollar value over the year's starting figure. Inventories were turned only 4.2 times in 1956, a record low, comparing to 5.5 times in 1955. Sales per sq. ft. of selling space dropped sharply.

Dealers reporting in the survey showed a dollar sales increase of 3.8% over 1955, approximately the same rise as shown by all U. S. dealers in this industry.

Net profit declines were shown by all five dealer sales volume groups and for all five geographical divisions.

The only product which showed pronounced rise in its share of total sales for 1956 was dryers; which rose from 4.4 in 1955 to 5.7% in 1956.

### Mandate for Dealers To Sharply Revise Some Practices

"The results of this dealer study must be regarded by our industry's retailers as far more than just a set of statistics," Stucky said. "Every retailer must see in this a mandate to sharply revise some of the practices he has permitted to penetrate his business." Among these he cited:

1. Regardless of the amount of pre-selling done by national advertising, the dealer must handle only merchandise which provides him with a sufficient margin to cover his operating expenses and allow him a reasonable profit.

2. It is necessary for the retailers to study all other sources of revenue available to him to select those which will supplement his normal retail proceeds, such as finance income from credit sales, profitable operation of his service department, and conversion of trade-ins to revenue.

3. Uncalled-for drainages on profits from the stores require new managerial diligence on the retailer's part, as failure to find the most economical method of shipping and delivering goods, refusal to accept faulty merchandise from the factories unless the factories compensate the firm for repairing it (as distinct from the present general practice of providing replacement parts only) and failure, particularly on the part of the smaller stores, to receive, and fully utilize, the cooperative advertising allowances due the dealers.

4. While some of the dealers' troubles may be traced to the practices of suppliers, high operating expense shown in the new NARDA study point to an acute need on the part of the merchants to modernize their business practices, improve the productivity of their entire organizations, and increase their business and executive efficiency.

Reviewing problems of 1956 and prospects for 1957, Snyder said that price-cutting, wrapping together all mentions of discount house competition, excessive trade-in allowances, etc., was the problem which led the list again in 1956.

In second place was "an imposing number of complains about 'too low' factory and distributor margin allowance" and in third position were references to "builder sales" by manufacturers and distributors.

Other dealer complaints about conditions that prevailed last year, in order of frequency of mention: 1) shortage of good salesmen; 2) overproduction and/or dumping by factories; 3) tight money; 4) low farm

*(Concluded on next page)*

*Table 1—Appliance Sales Breakdown by Product Type*

(Ranked by percentage importance of specific products according to 1956 results)

| Appliance | Per Cent of Total Sales 1956 | 1955 | 1954 |
|---|---|---|---|
| Total | 100.0 | 100.0 | 100.0 |
| TV, radios and record players | 31.7 | 28.8 | 35.6 |
| Washers | 17.3 | 18.6 | 13.6 |
| Refrigerators | 15.1 | 17.9 | 17.9 |
| Ranges—Total | 8.5 | 7.0 | 8.3 |
| Electric | 6.3 | 5.1 | 4.9 |
| Gas | 2.2 | 1.9 | 3.4 |
| Dryers | 5.7 | 4.4 | 3.3 |
| Freezers | 5.2 | 7.9 | 3.6 |
| Kitchen equip. | 3.9 | 2.5 | 2.6 |
| Air conditioning | 2.7 | 2.0 | 3.7 |
| Vacuum cleaners | 1.6 | 1.1 | 1.1 |
| All small appl. | 4.7 | 3.7 | 5.5 |
| Other major appl. | 3.6 | 6.1 | 4.8 |

*Table 2—Trade-In % to Unit Sale of Eight Key Items*

| Appliance | % of Sales Accompanied By Trade-Ins 1956 | 1955 | 1954 | 1953 | 1952 | 1951 | 1950 | 1949 | 1948 |
|---|---|---|---|---|---|---|---|---|---|
| Refrigerators | 69 | 70 | 66 | 68 | 69 | 56 | 42 | 35 | 18 |
| Washers | 67 | 70 | 68 | 65 | 62 | 52 | 49 | 41 | 27 |
| Ranges | 58 | 55 | 58 | 60 | 50 | 40 | 36 | 26 | 16 |
| Vacuum Cleaners | 27 | 36 | 35 | 32 | 31 | 28 | 36 | 31 | 22 |
| Television | 43 | 38 | 29 | 27 | 17 | 15 | 13 | .... | .... |
| Dryers | 5 | 10 | .... | .... | .... | .... | .... | .... | .... |
| Freezers | 11 | 8 | .... | .... | .... | .... | .... | .... | .... |
| Air Conditioners | 11 | 9 | .... | .... | .... | .... | .... | .... | .... |

*Table 3—National Operating Ratios for 1956 and Previous Years*

| Line | Item | National Averages 1956 | 1955 | 1954 | 1953 | 1952 | 1951 | 1950 |
|---|---|---|---|---|---|---|---|---|
| 1. | Net sales (mdse. plus service) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1-a | Net sales (mdse. only) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 2. | Cost of goods sold (mdse. plus service) | 67.7 | 65.7 | 66.0 | 67.1 | 68.0 | 68.8 | 69.2 |
| 2-a. | Cost of goods sold (mdse. only) | 69.3 | 68.4 | 68.8 | 70.2 | 69.8 | 70.3 | 69.7 |
| 3. | Gross margin (mdse. plus serv.) Line 1 minus line 2) | 32.3 | 34.3 | 34.0 | 32.9 | 32.0 | 31.2 | 30.8 |
| 3-a. | Gross margin (mdse. only) (Line 1a minus line 2-a) | 30.7 | 31.6 | 31.2 | 29.8 | 30.2 | 29.7 | 30.3 |
| 4. | Total operating costs (A through E below) | 31.1 | 30.9 | 31.4 | 30.6 | 28.8 | 28.3 | 24.8 |
| | A. Administrative | 22.1 | 22.2 | 22.3 | 21.2 | 20.6 | 20.4 | 16.9 |
| | (1) Owners and/or managers remun. | 3.7 | 3.2 | 3.8 | 3.4 | 3.6 | 4.1 | 3.6 |
| | (2) Office salaries | 2.8 | 2.4 | 2.2 | 2.2 | 2.1 | 1.6 | 1.5 |
| | (3) Salesmen's pay | 6.0 | 7.2 | 6.0 | 5.6 | 5.7 | 5.6 | 4.8 |
| | (4) Servicemen's wages and expenses | 5.5 | 5.2 | 5.5 | 6.0 | 5.1 | 5.7 | 4.5 |
| | (5) Vehicle expense | 2.5 | 2.7 | 2.9 | 2.4 | 2.4 | 1.8 | 1.4 |
| | (6) Other administrative expenses | 1.6 | 1.5 | 1.9 | 1.6 | 1.7 | 1.6 | 1.1 |
| | B. Occupancy expense | 2.6 | 2.8 | 2.9 | 2.5 | 2.5 | 2.5 | 2.6 |
| | C. Advertising expense | 2.6 | 2.5 | 2.5 | 2.5 | 2.6 | 2.7 | 2.2 |
| | D. Bed debt losses | 0.4 | 0.4 | 0.3 | 0.4 | 0.2 | 0.1 | 0.3 |
| | E. All other expenses | 3.4 | 3.0 | 3.4 | 4.0 | 2.9 | 2.6 | 2.8 |
| 5. | Net operating profit (Line 3 minus line 4) | 1.2 | 3.4 | 2.6 | 2.3 | 3.2 | 2.9 | 6.0 |

*Table 4—Special Analysis of Expense Details*

| | Ratios to Net Sales 1956 | 1955 | % of Total Expense 1956 | 1955 |
|---|---|---|---|---|
| **Total personnel, operating expenses and losses** | 31.1 | 30.9 | 100.0 | 100.0 |
| **Personnel Expenses** | 19.2 | 19.7 | 61.1 | 63.4 |
| a—Owner's and/or manager's salaries | 3.7 | 3.2 | 11.8 | 10.1 |
| b—Office salaries | 2.4 | 2.0 | 8.0 | 6.5 |
| c—Salesmen's pay | 6.0 | 7.2 | 18.4 | 23.3 |
| d—Servicemen's wages and expenses | 5.5 | 5.2 | 18.0 | 17.2 |
| e—Deliverymen's and warehousemen's wages | 1.2 | 1.7 | 3.7 | 4.9 |
| f—Employer's share social security and unemployment compensation | 0.4 | 0.4 | 1.2 | 1.4 |
| **Operating Expense** | 9.7 | 9.3 | 31.5 | 30.2 |
| g—Light and heat | 0.5 | 0.5 | 1.7 | 1.5 |
| h—Janitor service | 0.1 | 0.1 | 0.3 | 0.3 |
| i—Rent | 1.4 | 1.5 | 4.1 | 5.0 |
| j—Property taxes, etc. on real estate | 0.5 | 0.6 | 1.8 | 1.8 |
| k—Vehicle maintenance | 0.9 | 0.7 | 2.8 | 2.4 |
| l—Advertising | 2.6 | 2.5 | 8.3 | 7.9 |
| m—Office supplies | 0.4 | 0.4 | 1.1 | 1.2 |
| n—Credit and trade information | 0.05 | 0.04 | 0.2 | 0.1 |
| o—Collection costs | 0.05 | 0.06 | 0.2 | 0.4 |
| p—Miscellaneous administrative expense | 1.1 | 1.0 | 3.6 | 3.2 |
| q—Taxes (except on property) | 0.4 | 0.5 | 1.3 | 1.5 |
| r—All other expenses | 1.7 | 1.4 | 6.1 | 4.9 |
| **Losses** | 2.2 | 1.9 | 7.4 | 6.4 |
| s—Building depreciation | 0.1 | 0.1 | 0.4 | 0.4 |
| t—Vehicle depreciation | 0.4 | 0.3 | 1.5 | 1.1 |
| u—Shop equipment depreciation | 0.3 | 0.2 | 0.9 | 0.7 |
| v—Trade-in losses | 0.5 | 0.5 | 1.7 | 1.7 |
| w—Bad dept losses | 0.4 | 0.4 | 1.3 | 1.3 |
| x—Interest | 0.5 | 0.4 | 1.6 | 1.2 |


NEW heavy duty YEATS dollys handles BIG, cumbersome units amazingly easy! you ROLL - instead of lift it!

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(See Page 38)




*For more information about products advertised on this page use Information Center, page 22.*

# Costs-of-Doing-Business Survey --

*(Concluded from preceding page)*

income; 5) fake advertising; 6) poor quality products; and 7) color-TV backfiring."

### Problems Seen Continuing

Dealers looked forward to a continuation this year of many of the problems that confronted them in 1956, it was stated. The problems listed: 1) price-cutting; 2) lower manufacturer and distributor discounts; 3) trade-in pressures; 4) manufacturer and distributor selling to builders; 5) tight money; 6) shortage of good salesmen; 7) overproduction by manufacturers; 8) manufacturers' selling practices; and 9) poor quality products.

Opinions of the 79% of all dealers reporting in the survey as to the 1957 sales outlook showed that 41% expected sales to rise an average of 14% over 1956; 24% foresaw a sales drop, averaging 13%; and the remaining 35% expected no changes in sales from 1956.

A large majority group of the dealers pointed to the following product lines as having the best sales outlook for 1957 (listed in order of frequency of mention): laundry equipment, television, refrigerators, air conditioners, kitchen built-ins, hi-fi phonographs, radios, and color-TV.

Sticking their necks out on the profit prospects for 1957 were 59% of reporting dealers. Of this group, 46% expected to increase, by an average of 11%, over last year; 11% saw a profit drop averaging 10%; the remaining 43% believed profits will be about the same as in 1956.

### 85% of Dealers Plan To Act on Problems

Nearly 85% of reporting dealers gave indications of specific actions to be taken in 1957 in an effort to improve their situation. These actions were foreshadowed by their answers to four questions.

One of these was: "On which items that you did not emphasize in previous years do you plan to put special effort during 1957?" Product lines named most frequently in this connection include air conditioning, dehumidifiers, freezers, and kitchen built-ins, among others.

Only 31% of the dealers said they planned to hire additional sales help in 1957, but among those who intended to, the average addition was two.

At the top of the list of answers to a question on services to be offered outside radio-TV and appliances were hi-fi phonographs, furniture, and heating equipment. Random mentions were made of commercial air conditioning, water systems, boats and motors, plumbing equipment, cameras, auto air conditioning, records, and tape recorders.

### Economics Planned

The general statement, "reducing operating costs," led the list of answers to the question: "What economies are you effecting in your business this year?"

More specific indications were: cutting down on advertising; cutting service expense and personnel; reducing the sales staff; tightening credit control; improving the efficiency of the service operation; reducing the number of lines handled; improving inventory control methods; concentrating the operation under one roof; remodeling and streamlining the premises; cutting delivery costs; adopting improved accounting methods; changing from service trucks to cars.

### Overall Sales Show Small Gain

Of all dealers participating in the latest NARDA survey, a 64% majority group reporting comparative dollar sales figures for both 1956 and 1955 showed a sales increase of 3.8% last year.

Table 1 shows a percentage breakdown of 1956 total sales (as reported by 65% of participating dealers) into 10 product classifications, along with comparative data for earlier years.

Data showing the degree to which physical unit sales of leading appliances have been accompanied by trade-ins were first collected in the NARDA survey for 1946. In that year the analysis covered only refrigerators, washers, ranges, and vacuum cleaners. Television was added in 1950, and dryers, freezers, and air conditioners in 1955. Figures for 1956 and previous years are set forth in Table 2.

Of reporting NARDA dealers, 72% provided comparative figures on dollar profits for both 1956 and 1955 in the latest survey returns.

Snyder said the figures show these dealers "met Armageddon" on the profit front last year when their dollar profits declined 31.7% from 1955. Moreover, he added, returns show "a thumping 28% of all dealers reporting experienced net losses in 1956, this being the largest percentage of 'loss firms' ever recorded in a NARDA survey. Many of the 'profit firms' were barely on the borderline between profit and loss."

Table 3 is a historical summary of NARDA survey ratios.

Table 4 provides a breakdown of total operating costs into the 24 separate elements of expense listed in the NARDA survey schedule. Results are shown in terms of ratios to net sales and percentages of total expense for both 1956 and 1955 grouped under three main headings: Personnel expenses; operating expenses; and losses.

The over-all average net profit realization last year was 1.2% on net sales, an 11-year low. Analysis of the performance by sales volume groups shows that only one of these (dealers with sales in the $250,000 to $500,000 range) bettered the national average. All five of the sales volume groups showed drastic net profit ratio declines from 1955, it was reported.

The survey indicates that "the ill wind that brought the 1956 profit fiasco was not confined to any single geographic area. It swept across all five of the NARDA regions toppling the profit structure in each."

## Refrigerator Sales Hit 303,700 In May

NEW YORK CITY—The National Electrical Manufacturers Association reported total industry sales of electric household refrigerators in May amounted to an estimated 303,700 units, as compared with 346,800 for May last year.

First five months' sales in 1957 were 1,498,700 while first-five-months sales in refrigerators last year were 1,728,500.

Sales of electric freezers, including chest and upright models, totaled 82,300 in May, 1957 and 83,000 in May last year. First-five-months sales amounted to 376,400 in 1957 as compared to 425,100 in the like year-ago period.

It was noted that the data reported included exports and was based upon expansion of data reported to the NEMA Statistical Dept. to cover total industry sales.

## Instalment Buyers To Know What It's All About In Illinois

SPRINGFIELD, Ill. — A bill recently signed into law by Gov. William G. Stratton is designed to assure that instalment buyers know what they're getting and what they're getting into.

The new law requires that a written contract be signed by the buyer and the seller before the seller delivers the goods covered by the contract.

In addition, the law provides that detailed terms regarding insurance, delinquency, collection charges, and interest rates shall be included as a part of any instalment contract.

It further states that any contract not completely filled out at the time the buyer signs it is not enforceable except in the case of catalog mail order sales where terms are clearly stated in the catalog.


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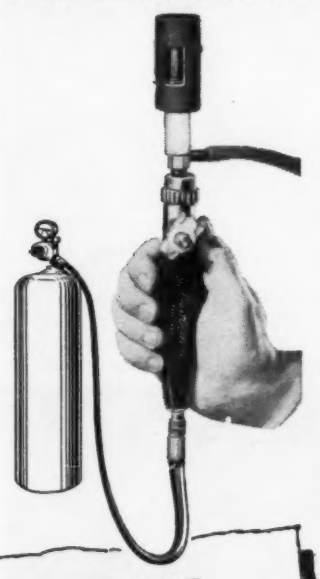

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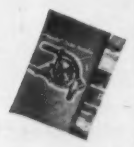

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**WHEN LINE VOLTAGE MEASURES**

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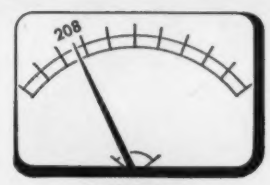
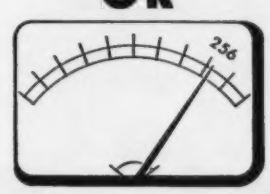



OR

ABOVE NORMAL

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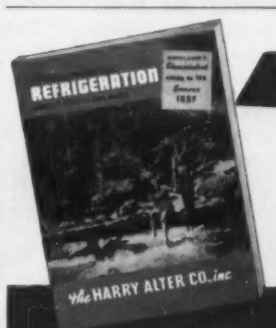


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# Where to find residential air conditioning dealers?

Today's key question in the residential air conditioning industry is being asked from every side: Who will sell the bulk of tomorrow's market? Appliance dealer, plumber, electrician or heating contractor? All have been mentioned but no single group has proven that they, above another, will control the market.

Truth is, some of all these groups will step forward as the air conditioning specialists of tomorrow. It depends entirely on each *individual's* determination to move ahead aggressively into the promising specialty of year-round residential air conditioning.

Meanwhile the problem: Amid this present dynamic development of distribution outlets the manufacturer is all but unable to identify his future volume dealer. Communication between product maker and potential seller is a challenge.

There is, however, one medium bridging this gap — AIR CONDITIONING & REFRIGERATION NEWS —— the only weekly newspaper of this industry, read and referred to by distributors and contractor-dealers alike. Each year, the NEWS invests tens of thousands of dollars to include in its circulation, the new individuals and the new corporations entering the field.

Whatever his past ties, the new contractor-dealer recognizes his dependence on the NEWS for the information he must have to be or to stay a successful residential air conditioning specialist. Because of this he pays to receive it. So the NEWS becomes the one medium able to bring you into contact with new distribution points as they emerge.

What better showcase for your selling message than in the one business paper that is seeking out and is finding the new residential air conditioning dealers? Advertise regularly in the NEWS.

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# Refrigeration Problems
## And Their Solution
### (*As Written by Paul Reed*)

The late Paul Reed, one of the refrigeration industry's most respected writers and teachers, wrote a column on "Refrigeration Problems and Their Solution" which was published regularly in AIR CONDITIONING & REFRIGERATION NEWS for more than 15 years.

Readers throughout the years have hailed this written material as some of the most practical and helpful that has ever been published. Fortunately, the author had an opportunity to revise some of this material and the NEWS is currently re-publishing it.

## Hot Weather Hints (6)

### THE EVAPORATIVE METHOD

(3) Another way that excessive head pressures of air-cooled machines can be lowered, is by taking advantage of the very large heat-absorbing capacity of the evaporation of water. If in some manner we can drip a comparatively small amount of water on to the air-cooled condenser, it would be evaporated and the heat required to evaporate it will come from the condenser, and thus reduce the head pressure.

If the condenser is 120° and if as little as one pint of 85° water is dripped on the condenser and evaporated, it will remove about 1,100 B.t.u. in being heated to 120° and evaporated.

This is almost a third of the total heat that the air-cooled condenser of a ⅓-hp. condensing unit on a display case must dispose of per hour, and is more than would be necessary to reduce a heavily overloaded unit to a normally loaded one.

Dripping water on an air-cooled condenser has many objections. It is messy and can be used only where some unevaporated water would not be objectionable if it ran down on the floor, such as on a basement concrete floor. It is hard on the condenser, especially if the condenser has steel fins and/or tubes as some present-day condensers do.

Care must be taken that only about as much water is dripped on the condenser as will be evaporated, for excess water will be blown by the fan, and if a suction fan is used, this free water will be thrown on and into the motor.

Dust and dirt cling more readily to the moist surface than if it were dry so the condenser gets dirty quickly, and the dirt even "burns" on and is hard to remove. This method should not be used at all if the waterd has a high mineral content, as it would soon form a coating on the condenser.

If this method is used, it is recommended that it be a purely temporary expedient to get over an emergency.

Nevertheless, it has been used many times and does have advantages, for it offers a method of disposing of a good deal of excess heat. Moreover, it does not require running water; a small tank of only a few gallons capacity can be used, and the water fed by gravity to the condenser.

### THE DRIP TUBE

In practice, it requires a small tube, such as a piece of ¼-in. o.d. copper tubing, into which have been drilled a number of very small holes ¾ to 1 in. apart, and this tube placed at the top of the condenser. A water supply is connected to the tube and water drips through the holes on to the condenser and is there vaporized.

The size of the holes is important, but there can be no set size, for it depends upon the size of the unit, the water pressure, how hot the condenser is, and how badly the unit is overloaded; all of which determine how much water must be vaporized.

It is difficult to get the holes small enough to prevent an excessive amount of water on the condenser, if the water pressure is high. In such cases a water-pressure reducing valve, such as are used on the bubblers of drinking water coolers, can be used to reduce the water pressure and consequently the flow of water from the holes.

For larger size air-cooled units, it is often feasible to install an evaporative condenser. Several units may be grouped on one evaporative condenser having multiple condenser coils.

### SUMMARY

In this series of articles, we have attempted to point out some ways to reduce loads and get everything possible out of refrigerating equipment, especially under peak conditions.

**To Review:**

*Reduce loads by reducing unnecessary losses;* from loose doors, wet insulation, careless neglect in leaving doors open, putting hot foods in the refrigerator; shading refrigerator from direct sun rays or from hot appliances, and similar measures on other types of applications.

Split up multiples—put part of the load on an additional machine.

Check for loose and slipping belts, leaking suction and/or discharge valves in the compressor.

*Keep suction pressure up.*

See that the evaporator is fully active; that the expansion valve is feeding fully, continuously.

Keep the evaporator as free of frost as possible. Reset the control or if necessary, install a timer to force periodic defrosting.

Remove any obstructions to proper circulation of air in the refrigerator.

*Keep head pressure down.*

Watch for recirculated air.

Remove any obstruction to free air circulation through the condenser and over the unit.

**Water-Cooled Condensers:**

Warm supply water.
Low water pressure.
Restrictions in pipes and valves.
Clean condenser.
Clean and readjust water control valve.

**Air-Cooled Condensers:**

Correct type of unit; low, medium, or high-temperature type.
See that fan is running in right direction (suction fan is preferable).
Correct pitch of fan blades.
Fan blades original size.
If all else fails:
Recommand user buy larger equipment, if required.
Install water-cooled condenser.
Install heat exchanger in discharge line from compressor to the air-cooled condenser.
Use evaporative method.
Install evaporative condenser.

**"VIRGINIA's" family of water treatment chemicals for safe, efficient equipment maintenance**

"Virginia's" complete line of water treatment chemicals are all specifically designed for the uses for which they are indicated in the air conditioning, refrigeration and heating industries. All were developed under field test methods which established their efficiency for practical use in protecting valuable equipment.

**WATER TREATMENT and SCALE INHIBITOR**
"Virginia" Water Treatment & Scale Inhibitor is a special blend of sparingly soluble glassy polyphosphates which hold scale-forming solids in suspension or solution, greatly reducing scale buildup on metal surfaces. The slow, controlled solubility of the crystals supplies a continuous, effective inhibiting dosage—no feeder devices are required.

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"Virginia" Ice Machine Cleaner rapidly and effectively removes scale and slime from ice machines. It eliminates the cause of objectionable odors and prevents formation of cloudy ice. It is easy, safe and economical to use.

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# Servicing Automobile Air Conditioners

*(Vol. 2)*

BY C. DALE MERICLE

In response to numerous requests, the NEWS has resumed the popular series on automobile air conditioners. Latest models (1956 and/or 1957) of makes covered in the earlier articles, plus additional ones, will be included in this new series, which will describe units of leading "independent" producers as well as automobile manufacturers.

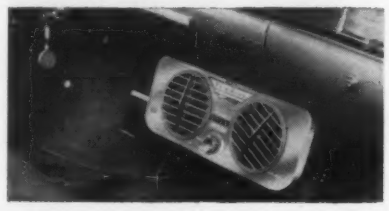

FIG. 1 is the 1957 model "Frigiking" under-dash unit.

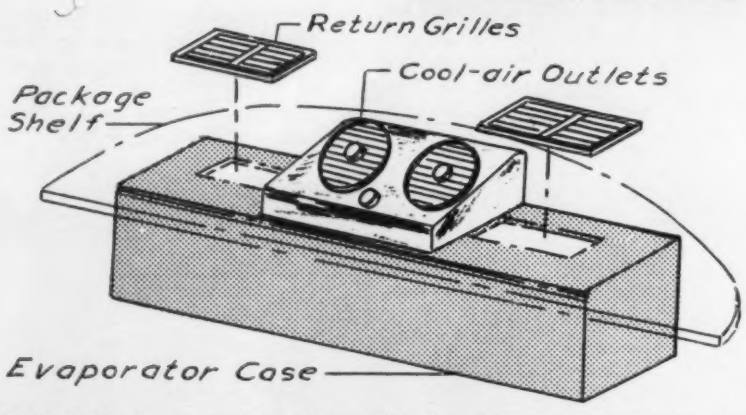


FIG. 2—Sketch shows completely packaged "Frigiking" trunk unit introduced in 1957.

## FRIGIKAR (1)

***Frigikar Corp.***
***1602 Cochran***
***Dallas, Texas***

Air conditioners produced by Frigikar in 1956 and 1957 included "Frigiking" under-dash models (Fig. 1), "Frigikar" trunk units. "Frigikab" models for trucks, and (introduced in 1957) a trunk model Frigiking.

The 1957 Frigiking rear unit (Fig. 2) represents a new development in trunk models in that the evaporator case, air outlets, and air returns are in a complete package which extends up through the parcel shelf of the car.

Frigikab truck units are available in several models, including an under-dash design identical with the Frigiking under-dash unit, and various types of overhead units for truck cabs.

All standard models made by this manufacturer in 1956 and 1957 employ a compressor belt driven off the car engine through a magnetic clutch. Condenser is located in front of the radiator.

Thermostatic control is provided in all standard models.

Refrigerant-12 is employed throughout the Frigikar line.

### Compressor

The Tecumseh HH automotive compressor is standard on Frigikar conditioners. A few cars, however, will be found equipped with the Lehigh V-93 compressor.

Service valves of the HH compressor can be located on the sides or back of the unit. When mounted in vertical position, the suction service valve is normally on left side (as viewed from flywheel end) and discharge valve on right side.

The service valves are in the same corresponding location at the back of compressor. Thus, when the compressor is mounted horizontally, the suction service valve on the rear will be above the discharge service valve. If the particular installation so requires, one valve can be on side of compressor with the other on the back.

The Lehigh V-93 is a V-type compressor. Suction service valve is on top between the two cylinder heads; discharge service valve is on rear of unit.

Warner magnetic clutches are employed on all standard 1956 and 1957 Frigikar conditioners.

### Condenser

Condenser is located between the front grille and car radiator.

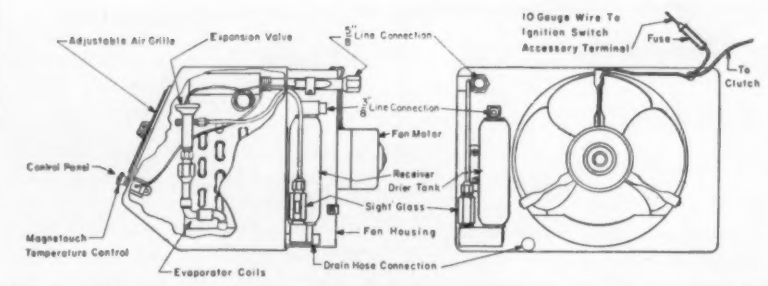


FIG. 3—Side and rear view of 1956 "Frigiking" under-dash cooling case assembly.

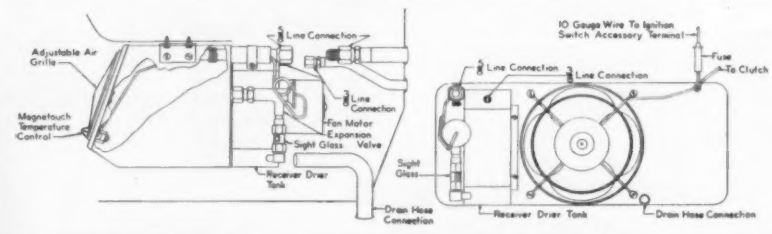


FIG. 4—Side and rear view of 1957 "Frigiking" under-dash cooling case assembly.

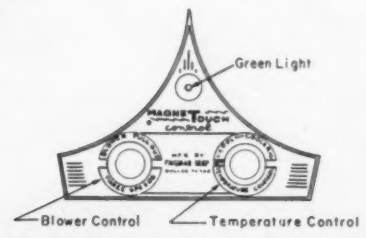


FIG. 5—Control panel mounted on 1956 "Frigiking" under-dash unit.

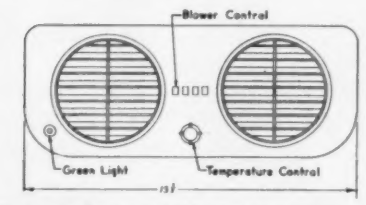


FIG. 6—Front of 1957 "Frigiking" under-dash unit has pushbutton blower controls, temperature control, and clutch pilot light.

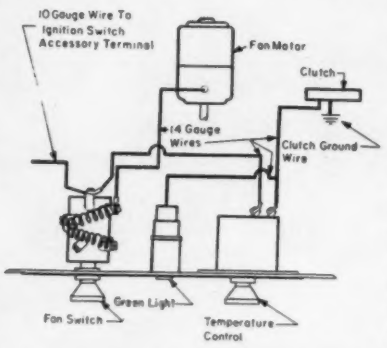


FIG. 7—Wiring diagram of 1956 "Frigiking" under-dash unit.

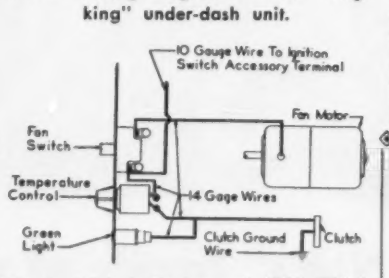


FIG. 8—Wiring diagram of 1957 "Frigiking" under-dash unit.

Both inlet and outlet connections are on the left (driver's) side in most applications, although in some cars it will be found inverted with the connections on the right side.

### Evaporator

Cooling case assembly of 1956 and 1957 Frigiking, Frigikar, and under-dash Frigikab units houses the evaporator coil, expansion valve, blower(s), thermostat controlling magnetic clutch, and receiver-drier-sight glass assembly.

Fig. 3 shows cooling case of 1956 under-dash unit; Fig. 4, the 1957 Frigiking under-dash cooling case.

A-P thermostatic expansion valves are used throughout. A number of the 1956 Frigiking under-dash units, however, employed a capillary tube instead of expansion valve.

A single propeller type fan is employed on Frigiking models. Air is discharged into the car through two round, adjustable air outlets. A similar arrangement is provided in the 1957 Frigiking trunk unit. Return air intakes on the Frigiking trunk unit are located on each side of the air outlets.

Two squirrel cage type blowers are employed in the Frigikar trunk units. Flexible ducts extend from each side of the cooling case assembly to discharge outlets mounted in the package tray directly above. Return air is brought to the unit through a grille in the middle of the package tray.

### Controls

Controls on all standard 1956 and 1957 models produced by this manufacturer include three-speed fan or blower controls and thermostat for cycling the clutch.

A green pilot light shows when the clutch is energized.

Controls of the Frigiking and Frigikab under-dash units are mounted directly on the evaporator case assembly.

Blower control of 1956 Frigiking is a push-pull knob providing three speeds as well as "off" position. (See Fig. 5.)

Four pushbuttons serve as the fan control on 1957 Frigiking units to give the three speeds and "off" setting of the blower. (Fig. 6.)

Thermostat employed to cycle the clutch and thus the compressor has a control knob on the Frigiking under-dash unit which is turned clockwise from its "off" position to turn the clutch circuit on and permit selection of amount of cooling. Power element capillary of the thermostat is attached to suction line directly ahead of expansion valve bulb. Frigikar calls this its "MagneTouch" control.

Fig. 7 shows wiring diagram of 1956 Frigiking, Fig. 8 shows wiring of 1957 Frigiking.

For the trunk-mounted Frigikar and Frigiking models a control panel is attached to the dash of the car. This panel has three-speed blower controls (a right and left blower control on Frigikar, a single control for the Frigiking) and toggle switches for turning the system on and off in addition to selecting either automatic cycling of the clutch and compressor by thermostatic control of constant operation of the compressor.

Adjustable thermostat of these trunk models is located in the cooling case assembly but can be adjusted from the package tray.

*(To Be Continued)*

GREAT
FOR THE "SHAKES" IN COMPRESSOR PIPING
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NOW AVAILABLE FROM FLEXONICS
Flex-O-Tube synthetic Freon-resistant hose for refrigeration and air conditioning service. Write for information.

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All-metal Flexon Vibra-Sorbers provide excellent resistance to corrosion and fatigue . . . remain gas-tight under prolonged vibration . . . come to you clean in sealed polyethylene bags. U.L. listed in sizes ⅜" through 1½" for both high and low side service. Standard diameters to 8" available. Write for Bulletin 139.

V-23

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In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

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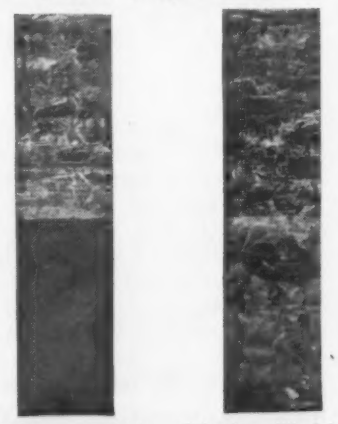

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## Bid Shopping Bill--

*(Concluded from Page 1, Col. 5)*

mittee should decide to give them any serious consideration."

Hokum's objections were that the bills "unwisely" establish a single contract system for construction contracting by the Federal government, encourage rather than prevent bid shopping and bid peddling, break down standards under state laws, and set an "arbitrary, destructing, and unrealistic" 5-ft. line as the limit for mechanical specialty contracting work.

Hokum said, "The bills declare and establish for the Federal government a single contract system of procurement under a general contractor, solely responsible for all construction, and thereby would prevent or discourage the Federal government from directly and separately contracting mechanical specialty work, such as heating, plumbing, air conditioning, refrigeration, and electrical work.

"This freezes contracting methods regardless of cost or efficiency and prevents a specialty contractor from bidding on direct work even if this method of contracting should save money for the government."

NAPC officials charge that changes made in the bill have robbed it of much of its original value as a deterrent to bid shopping on government construction contracts.

But what is worse, they say, is a clause inserted in the definition of mechanical specialty work limiting it to a point 5 ft. outside the building line. This would include refrigeration and air conditioning work.

The danger, NAPC explains, is that this limitation would "establish a very important future contracting pattern for the specialty contractor.

"If work which he is accustomed to perform as a part of his major specialty is omitted from the separately listed specifications because it is not technically 'mechanical specialty work,' as defined by the bills, then this accustomed work will undoubtedly be lumped with another subcontract or performed by the general contractor, or let for separate bidding or subbidding, with the very real possibility that the special contractor either cannot or cannot successfully bid or compete on this work.

"This would result in a very real, completely arbitrary and entirely unnecessary hardship to the specialty contractor and to the journeyman whom he customarily employs."

NAPC contends that the House judiciary committee, in considering the House version of the measure, was erroneously advised that the 5-ft. line was the historical extent of the work of the trades performing interior mechanical construction in buildings.

It asserts, "the 5-ft. line is totally unknown to heating, piping, air conditioning, refrigerating, ventilating, and electrical work.

"It is practically unknown in plumbing work and never rigidly followed in those minor instances where it may have received some recognition."

Originally, NAPC pointed out, the bill was confined to requiring the prime contractor, bidding on Federal government work, to list his specialty subcontractors and to use these specialty subcontractors in contract performance, unless they refused to do the job. In such even, the substitute contractor would have to be approved by the Federal contracting agency.

But, as now written, the bill permits a general contractor, at any time within five days after the date of the opening of the bids or proposals therefor, to engage a substitute or different contractor or perform the work himself by simply notifying the contracting agency.

"In this way," comments NAPC, "there seems to be permitted a five-day open season on every contract for bid shopping or peddling by every contractor who, despite the moral deterrent of publicity, nevertheless desires to engage in these practices."

## Byrd Elected--

*(Concluded from Page 1, Col. 2)*

of air moving devices," he stated. "To do this, we are realigning two key executives."

Byrd attended Miami university, Oxford, Ohio. He was associated with the Armco Steel Corp., Middletown, Ohio, in the market development department from 1928 to 1943. In the latter year, he joined Lau as sales manager, later becoming vice president in charge of sales. In February, 1955, he was elected executive vice president.

Widely known in the warm air heating and air conditioning industries, Byrd is first vice president of the National Warm Air Heating & Air Conditioning Association. He is also an associate member of the American Society of Heating & Air-Conditioning Engineers.

He is a past president of the Air Conditioning Blower Manufacturers Association and has served on the board of trustees of the Oil Heat Institute. He has been affiliated with the Propeller Fan Manufacturers Association and is an associate member of the National Heating Wholesalers Association.

## Keco Shows Coolers At Air Power Panorama

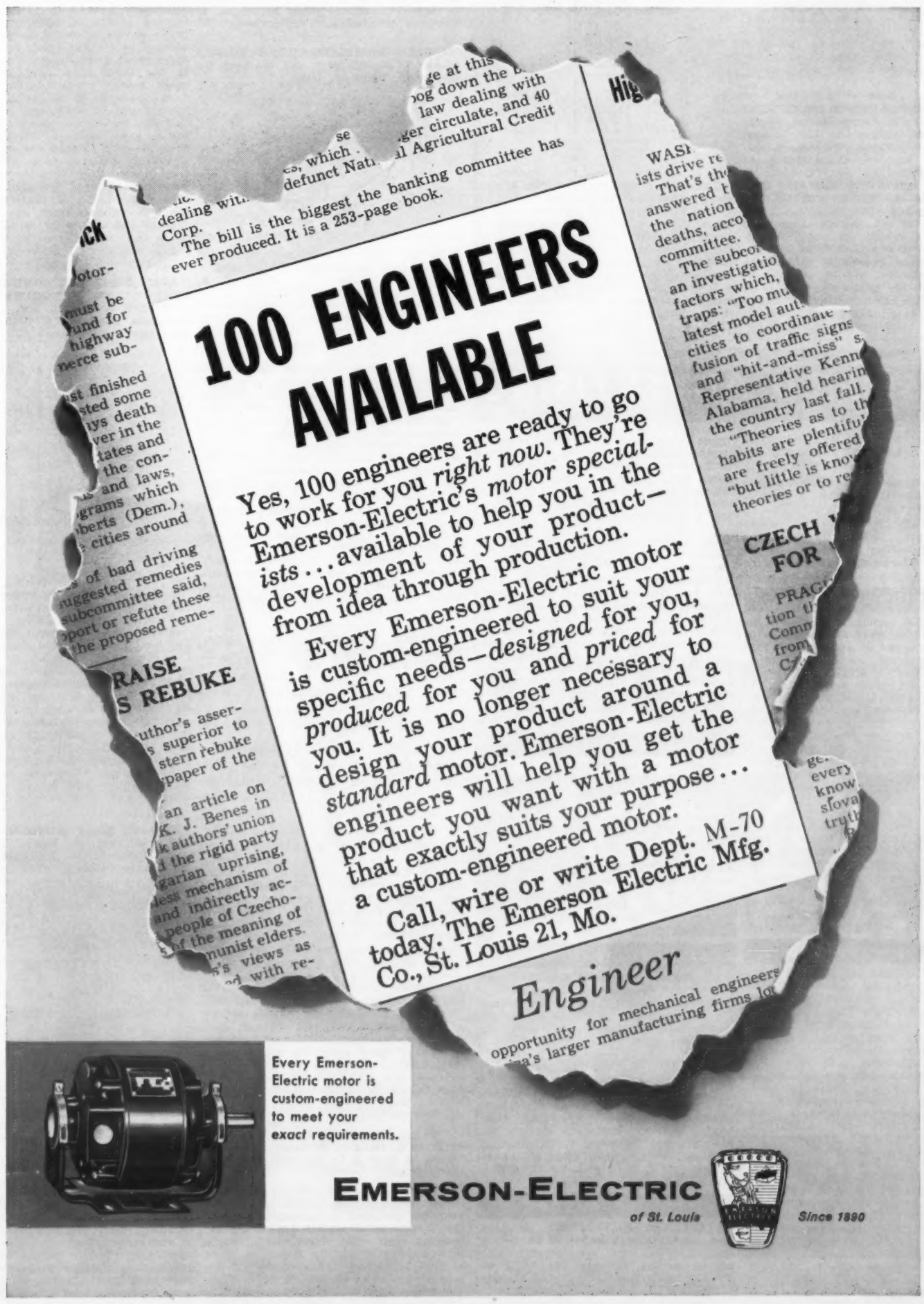
CINCINNATI — An exhibit prepared by Keco Industries, Inc., for the Air Force Association's 1957 Air Power Panorama held in Washington, D. C. recently featured mobile air conditioning units of various sizes and power sources for use in Air Force ground installations.

Keco also showed air conditioning units of 24,000 to 120,000 B.t.u. capacities, specially designed for the trailers that house radar.

## Air Conditioners Lead Major Appliance Sales In Knoxville Area

KNOXVILLE, Tenn.—During the month of June, air conditioning far outsold all other major electrical appliances, both in unit sales and dollar value, in the area served by the Knoxville Utilities Board. Air conditioning sales even exceeded combined unit sales of refrigerators and home freezers.

The 39 dealers in the area reported sales of 924 air conditioners with a value of $187,805. Home freezers sold were 331, for a dollar volume of $97,479, and refrigerators, 464, with a value of $119,106.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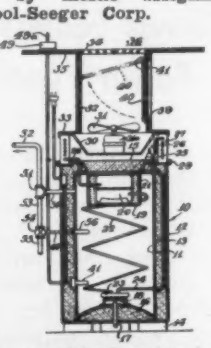
# PATENTS

## Week of June 18

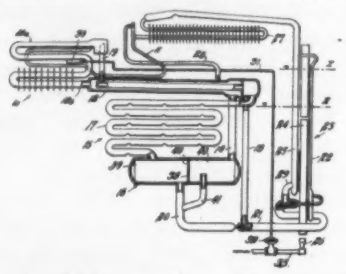
**2,795,938. HEAT PUMP HOT WATER HEATER AND AIR CONDITIONER. Joseph A. Galazzi, Evansville, Ind., assignor, by mesne assignments, to Whirlpool-Seeger Corp.**



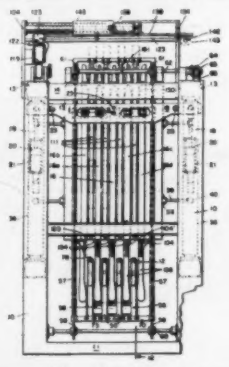
1. In a combined water heater, air conditioner, and dehumidifier of the floor mounted type, the combination of a water tank, heat insulation surrounding the water tank, and an external shell enclosing said heat insulation, a refrigeration system including a sealed motor compressor mounted in said water tank and having its compressor outlet connected to a condenser submerged in the water of said tank, said condenser being connected to a restrictor, and said restrictor being in connection with an evaporator on the outside of said tank and located above said tank. . . .

**2,795,940. ABSORPTION REFRIGERATION. Wilhelm Georg Kogel, Stockholm, Sweden, assignor to Aktiebolaget Elektrolux, Stockholm, Sweden, a corporation of Sweden. Continuation of application Serial No. 282,778, April 17, 1952. This application May 15, 1953, Serial No. 355,289. Claims priority, application Sweden April 26, 1951.**

1. In the art of refrigeration with the aid of a system in which refrigerant vapor is expelled from absorption liquid in a generator, refrigerant vapor is liquefied, liquid refrigerant evaporates in the presence of an inert gas in an evaporator, refrigerant vapor is absorbed into absorption liquid in an absorber, inert gas is circulated between the evaporator and absorber and absorption liquid is circulated in a path of flow through and between the generator and absorber, the improvement which comprises the steps of maintaining a body of absorption liquid in a first place in the path of flow of such liquid, flowing liquid refrigerant in the system to a second place which serves as a place of accumulation for such liquid. . . .

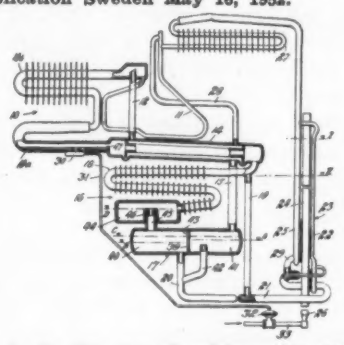


**2,795,939. APPARATUS FOR FREEZING PACKAGED PRODUCTS. Isaac H. Polk, San Jose, Calif., assignor of 5% to William R. Graham and 5% to Collins Mason, Los Angeles, and 40% to John S. Drum, Jr., and 10% to Emory L. Morris, San Francisco, Calif.**



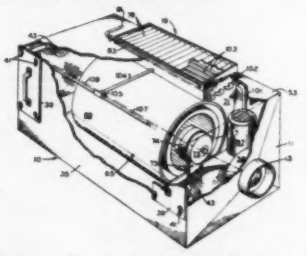
1. In a machine for freezing packaged substances, a pair of substantially vertically disposed refrigerated plates between which packages of a substance to be frozen are received, an elongated package supporting means of a width to be received between said plates mounted for movement vertically between said plates, said means including a longitudinally movable package supporting member across the top of said means, and means for imparting movement to said member.

**2,795,941. ABSORPTION REFRIGERATION. Axel Gosta Hellstrom, Johanneshov, Sweden, assignor to Aktiebolaget Elektrolux, Stockholm, Sweden, a corporation of Sweden. Continuation of application Serial No. 355,329, May 15, 1953. This application May 29, 1956, Serial No. 588,126. Claims priority, application Sweden May 16, 1952.**



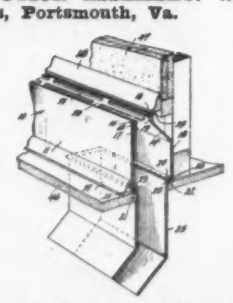
2. In the art of refrigeration with the aid of a system in which refrigerant vapor is expelled from absorption liquid in a generator, refrigerant vapor is liquefied, liquid refrigerant evaporates in an evaporator, refrigerant vapor is absorbed into absorption liquid in an absorber and absorption liquid is circulated in a path of flow through and between the generator and absorber, the improvement which comprises the steps of maintaining a body of absorption liquid in a first place in said path of flow for such liquid, flowing liquid refrigerant in the system to a second place which serves as a place of accumulation for such liquid.

**2,796,014. DAMP AIR AUTO COOLER. Elmer I. Montgomery and Herbert G. Obendorf, Redding, Calif.**



2. An air conditioner of the water evaporative type for automobiles comprising a housing adapted to be mounted in the automobile trunk compartment, a horizontal partition in said housing arranged to divide the interior thereof into upper and lower compartments, said lower compartment forming a reservoir adapted to hold a quantity of water, air inlet openings formed in respective opposite end portions of said housing, said openings communicating with said upper compartment of the housing, ram air scoops mounted exteriorly of the automobile body on either side thereof, air conduits connecting said ram air scoops with said air inlet openings, a power driven blower mounted in said housing with its air inlet disposed in said upper housing compartment and having an air discharge duct extending through an opening formed in the top of said housing, said discharge duct being adapted to register with an opening provided communicating from the trunk compartment with the passenger compartment. . . .

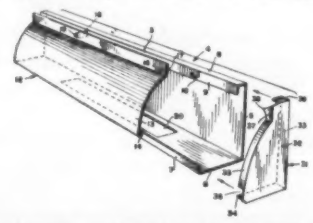
**2,796,015. BASEBOARD AIR DISTRIBUTION ASSEMBLY. William G. Hayes, Portsmouth, Va.**



7. A baseboard air distribution assembly comprising a hollow base member having front, rear and bottom walls, said front and rear walls each having a portion extending below said bottom wall, a generally horizontal flange extending inwardly from the lower end of said extended portions thereby forming forward and rearward lower channels, said bottom wall having an air inlet opening formed therein, a conduit boot having flange means adjacent one end thereof, said flange means being slidably receivable in said channel, whereby said conduit boot may be slid along said channel to a position in which the opening in said boot registers with the opening in said bottom wall.

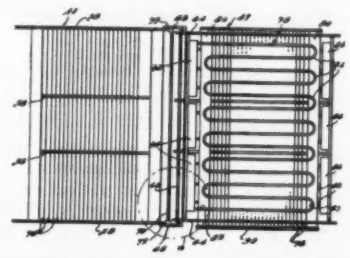
**2,796,016. BASEBOARD DIFFUSER. William C. De Roo, Holland, Mich., assignor to Hart & Cooley Mfg. Co., Holland, Mich.**

1. A baseboard diffuser comprising in combination, a back section including a rear upright wall, a forwardly extending bottom wall, and a forwardly extending top wall terminating in a downwardly extending flange, a front section extending arcuately in an upwardly and rearwardly direction from the front edge of said bottom wall and terminating in a flange portion substantially parallel with said first flange, the upper edge of said second flange



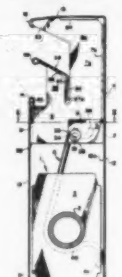
terminating adjacent said top wall and in spaced relation thereto, and means connecting said first and second flanges to maintain them in said spaced relation.

**2,796,037. APPARATUS FOR MAKING HEAT EXCHANGERS. Harry S. Boorman, Livonia, Mich., assignor to Wall Wire Products Co., Plymouth, Mich.**



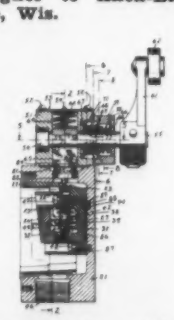
1. Apparatus for assembling a heat exchanger formed of rod stock and a formed length of tubing which comprises a pair of racks hinged together, each of said racks being provided with a series of slots for holding rod stock in the form of a grid, one of said racks having provisions for locating a formed length of tubing above and in direct contact with the grid carried thereby, means for clamping said tubing to said one rack thereby to clamp said one grid to said one rack in order to permit the same to be inverted relative to the other rack so as to sandwich said tubing between said grids, said racks being of skeletal construction to expose from opposite sides thereof the points at which said rod stock and tubing cross when said tubing is sandwiched between said grids.

**2,796,238. FINNED TUBE RADIATOR SUPPORTING STRUCTURE. Arthur O. Sjoden, Louisville, Ky., assignor to American Radiator & Standard Sanitary Corp., Pittsburgh.**



1. A heat exchange apparatus comprising a finned tube heat exchanger, an upright wall member, a bracket member secured to said wall member and having a horizontal supporting portion extending parallel to said wall member, a supporting member having a downwardly open hook portion extending toward said wall member and longitudinally slidable and rockable on said supporting portion, said supporting member extending downward from said supporting portion and having adjacent its lower end an upwardly open hook portion extending toward said wall member and facing said downwardly open hook portion. . . .

**2,796,487. SNAP ACTION MECHANISM. William P. Dehn, Wauwatosa, Wis., assignor to Allen-Bradley Co., Milwaukee, Wis.**



1. In a snap-action mechanism, the combination comprising: a support; a rotatable member, mounted on the support for reciprocating rotation with respect to the support; stop means, for limiting the rotation of the rotatable member in each direction; and means for deriving and storing-up energy from such rotation during at least a part of approximately the first half of such rotation in each direction, and for then abruptly releasing this stored energy during at least a part of approximately the second half of such rotation to enhance such rotation, said last-mentioned means comprising: a ball cage, disposed about the axis of the rotatable member, and fixed to said member, and having a plurality of holes extending therethrough substantially parallel to said axis. . . .

**Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.**

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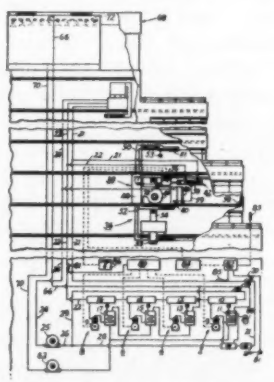
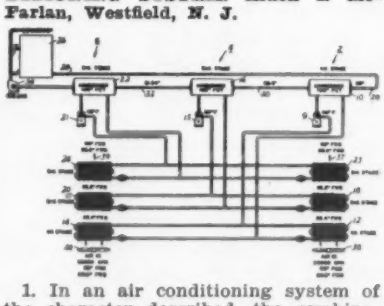
## Week of June 25

**2,796,740. AIR CONDITIONING SYSTEM. Alden I. McFarlan, Westfield, N. J.**



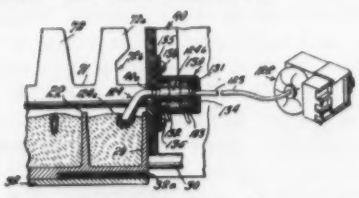
1. In an air conditioning system which is adapted to provide heating and cooling for a plurality of zones which normally constitute different heating or cooling loads, the combination of a plurality of air treating units which are adapted to provide air to the respective zones, each of said units including a heat transfer coil through which air is passed to provide the heating or cooling of the air in accordance with the demand of that zone and means to direct air through said coil, refrigeration means including an evaporator and a main condenser, an auxiliary condenser connected in parallel with said main condenser. . . .

**2,796,743. PLURAL STAGE AIR CONDITIONING SYSTEM. Alden I. McFarlan, Westfield, N. J.**



1. In an air conditioning system of the character described, the combination of, a plurality of refrigeration units each of which has a condenser and an evaporator, each of said condensers being adapted to be cooled by water, a cooling tower which is adapted to cool water, circuit means connecting the water circuits to said condensers in series, pump means to circulate water through said condensers and said cooling tower in series, and means to pass a stream of a fluid to be cooled through said evaporators. . . .

**2,796,741. ICE MAKING. Ralph D. Barton, Evansville, Ind., assignor to Servel, Inc., New York, N. Y.**



In an automatic ice maker, an ice mold, means for dividing the mold into a plurality of ice forming compartments, means for filling the mold with water to be frozen, refrigerating means for freezing the water in the mold, means for freeing the ice from the mold, means for removing the ice

*(Continued on next page)*

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MANUFACTURER'S REPRESENTATIVES with commercial refrigeration experience wanted. We have several desirable territories open. Complete line refrigerated display and storage fixtures, including latest design self-service models for supermarkets; also bakery refrigerators and complete line institutional and restaurant refrigerators. Contact dealers, distributors, and food chains. Give complete details as to experience and industry references in first letter. Replies held in confidence. BOX A5848, Air Conditioning & Refrigeration News.

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ATTENTION SERVICEMEN: Send for free circulars and bulletins on refrigeration parts and equipment. Real money saving values: WALTER W. STARR, 2833 Lincoln Avenue, Chicago 13, Illinois.



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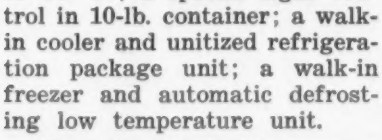
# PATENTS

*(Continued from preceding page)*

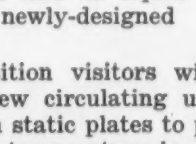
from the mold and control mechanism for said filling, freezing, freeing and removing means, said ice mold having one compartment thereof at least partially insulated from the refrigerating means whereby the water is completely frozen in the other of the plurality of compartments while there is still unfrozen water in said one compartment, and said control mechanism including a thermostat having a temperature sensing element thereof in physical contact with the last water to freeze in said one compartment.

**2,796,742. ICE TRAY. Gilbert G. Platt, Santa Ana, Calif.**



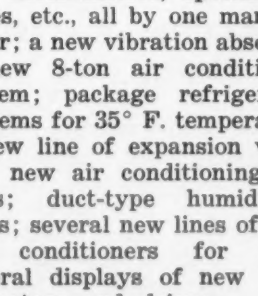
1. An ice-freezing tray comprising a body having a plurality of compartments each having a half-round bottom wall and partition walls extending upwardly from said bottom wall and substantially tangent thereto, said partition walls being inclined from the vertical in like direction when said tray is horizontal.

**2,796,744. REFRIGERANT COMPRESSOR COOLING. Oskar H. Buschmann, Sidney, Ohio, assignor to Copeland Refrigeration Corp., Sidney, Ohio.**



1. In combination with a refrigerating system including a refrigerant compressor having a housing and shaft sealing means, an oil cooling system adapted to utilize the residual cooling capacity of refrigerant in the compressor suction line comprising a shaft sealing mechanism normally disposed in an oil-filled chamber within said housing, an annular cooling chamber defined by said housing and coaxially disposed about said shaft seal chamber in heat transfer relation thereto, said cooling chamber having an outlet and in exterior inlet opening. . . .

**2,796,745. FAN MOTOR MOUNTING STRUCTURE FOR ROOM AIR CONDITIONERS. Stanley E. Rose, Erie, Pa., assignor to General Electri Co.**



1. A room air conditioner comprising a casing, a partition dividing said casing into separate indoor and outdoor compartments, said partition having an opening therein, air circulating means for circulating air through each of said compartments comprising a motor disposed in said opening, a motor drive shaft having the opposite ends thereof extending into said compartments, fan means mounted on the ends of said shaft and means for supporting said motor comprising a pair of opposed cup-shaped members having peripheral edge portions secured to said partition adjacent said opening with the respective bottoms of said members extending into said compartments whereby said members form a hollow shell enclosing said motor. . . .

*(To Be Continued)*

# Men on the Move . . .

**Olin Mathieson Chemical Corp.**—SAM GURLEY, JR. has been appointed vice president of sales for Olin Aluminum. Gurley had been vice president-sales of H. K. Porter Co., Inc., Pittsburgh.

**General Controls Co.**—Managerial changes in three of 42 branch offices have been announced. They are: MAL JOHNSON, formerly regional industrial controls representative in Chicago to assistant branch manager, Chicago; LLOYD MILLER from field representative in Chicago branch office to manager, St. Louis branch; RICHARD MATZ promoted from field representative in the Detroit office to manager of Indianapolis office.

Three new staff appointments are also announced. They are: RUSSELL BARTMES to account executive for the appliance controls division in the Chicago region. Bartmes rejoins General after a two-year absence. RICHARD NALBERT to field engineer in the national sales department. He will serve as liaison with underwriters and assist with field control application problems. GORDON WALKER, up from staff engineer in national sales to account executive for gas heating and appliance controls in the New York region, headquartered in the New York branch.

**Worthington Corp.** — WILLIAM A. MEITER has been appointed to the newly created cost of vice president-employe relations and organization development. He had been associated with Worthington since 1927, and his most recent previous assignment was general marketing manager. A WILLIAM FRASER, present commercial vice president in charge of the district sales offices at Chicago, Denver, Kansas City, St. Louis, and Minneapolis, will succeed Meiter as general marketing manager.

**Wiley-Bayley, Inc. (Seattle)**—W. KEN BROWN has been appointed sales-engineer in the Oregon-southwest Washington area for this Northwest distributor of "Styrofoam" insulation.

**Insulation Div., Armstrong Cork Co.**—ARTHUR R. CONATY has been appointed manager of a new branch office at Elizabeth, N. J. Sales representatives assigned to the new branch office are: P. L. BIEGLER, C. E. GEIGEL, and HUGH N. MARCH.

**Air Conditioning Div., Westinghouse Electric Corp.**—J. RUSSELL CARNEY has been appointed finance administrator. He will develop various financing plans for Westinghouse air conditioning dealers, distributors, and contractors.

**Maytag Co.**—GUY O. HECK has been named a regional manager for the Maytag Richmond branch. He is headquartered at Raleigh, N. C. Heck, having recently completed a training program at the firm's Newton, Iowa headquarters, will serve Maytag dealers in 19 North Carolina counties.

**Trane Co.**—Twelve U. S. and Canadian college and university engineering graduates having just completed an advanced engineering training program of the Trane Co., have been assigned to sales offices. The men and their assignments, are: ROBERT CHARETTE, Montreal, Can.; JOHN DUNHAM, Pittsburgh; WILLIAM H. GARDINER, Cleveland; MYRON E. HUMZEKER, Peoria, Ill.; ROBERT M. ISAAC, Los Angeles; ROLLAND A. NEVE, New Orleans; WILLIAM A. PLUMMER, Cincinnati; GEORGE W. RAE, JR., Harrisburg, Pa.; LEE R. ROYAL, Dallas; ROBERT L. TARRANT, Gainesville, Fla.; and ROBERT WILLIAMS, Birmingham, Ala.

**Vilter Mfg. Co.**—HOWARD EGGERT has been promoted to district sales engineer. In his new post Eggert will represent the firm in Racine and Kenosha counties, Wisconsin north of Milwaukee, and Upper Michigan. He will succeed FRANCIS PALLANCH, who has been named district manager of the firm's Minneapolis office.

**Water Service Laboratories, Inc.** (New York City)—MILTON W. SNYDER has joined the engineering department of this firm of chemical engineers and corrosion control specialists. Snyder was formerly application engineer in the water conditioning section of the Allis Chalmers' power department. He will be employed at the company's New York City office.

**Heil Co.** (Milwaukee)—F. M. JORDAN has joined the Heil Co. heating and cooling division as sales manager. He was formerly with Timken Silent Automatic Div. of Scaife Co., Pittsburgh.

**Stewart-Warner Corp.**—C. W. VAN ALLEN has returned to the export department after serving as export manager of a Racine, Wis. firm. He fills a new position.

**Rheem Mfg. Co.**—WILL H. ROY, general staff purchasing agent, has been named to the newly-created post of administrator of inventory management and internal control. KENNETH H. RIHA, division purchasing agent of the Rheem Container Div., has been upped to assistant to the director of purchasing.

# Preview of 10th ARI Exposition Exhibits--

*(Concluded from Page 1)*

built entirely of aluminum; a new 375-gal. factory-sealed bulk farm cooling tank with hermetically-sealed refrigeration system.

Pushbutton thermostats for heating and cooling; air conditioning control panels, 1-piece and 2-piece; a new shaded pole micromotor designed for heating, air conditioning, and ventilating applications; a single bearing shaded-pole monomotor; a new scoop-type air velocity meter and a carbon monoxide detector; new space-saving design condensing units for commercial refrigerators.

A 6-pole shaded pole motor with a 5-in. diameter and ratings from 1/30 to 1/6 hp. in #51 frame; a new line of double-suction, horizontal split case pumps; a self-contained combination pre-mix soft drink and ice cube maker; a display case that can be dial set from -10° to 44° F.; a special algae control in 10-lb. container; a walk-in cooler and unitized refrigeration package unit; a walk-in freezer and automatic defrosting low temperature unit.

Other firms will show a new line of walk-in coolers and freezers; three-way condensing water regulators for use with cooling towers; a space-saving condensing unit rack; a new refrigerated baker's table; add-on and wall mounted hot water dispensers; full line of liquid indicators; newly-designed filter-driers.

Exposition visitors will also see a new circulating unit for use with static plates to provide uniform temperature in any refrigerated truck body; electric hammers and lock hammers; a 2,000-lb. capacity automatic tube-ice machine; hot and cold beverage center and in-a-wall water coolers; a 9-cylinder R-22 or ammonia compressor; new type ducting for high and low pressure air conditioning systems; a combination low temperature and normal temperature walk-in cooler and new self-contained automatic defrost freezer for ice cream, introducing color dynamics to increase ice cream sales.

A new automatic defrost for mullion unit, automatic defrost walk-in coolers, air conditioning coils, and unit coolers will be on display, with working demonstrations in one booth.

Other product displays include: a new quick-coupler charging line; a multi-can charging kit for automotive air conditioning; an air-cooled commercial twosome condensing unit assembly and a 150-gal. bulk milk cooler in operation; fabricated tubular parts including return bends, manifolds, headers, spun end parts, strainers, accumulators, special bent tubes, etc., all by one manufacturer; a new vibration absorber; a new 8-ton air conditioning system; package refrigeration systems for 35° F. temperature; a new line of expansion valves and new air conditioning controls; duct-type humidifying units; several new lines of room air conditioners for 1958; several displays of new liquid indicators and driers.

A new copper deck cooling tower and air-cooled condensers will be presented by one manufacturer, along with package air conditioners of 10 to 40-ton capacity. Another will show its new filter drier with a new dessicant, and a 100-ton-capacity solenoid valve for Refrigerant-12.

A line of tube benders in a new display package will be shown, also, as will reverse-cycle valves, two-way control valves, a special flux for silver alloy brazing at higher than normal temperatures, a lightweight sectional walk-in cooler, new commercial defrost controls, a full-acceleration, part-winding start control, an improved vapor barrier, and a new portable room cooler.


NEW Designs and Features!
P-H REFRIGERATORS and FREEZERS

MODEL P 40-2 Self-Contained

Important features of the newly styled and completely redesigned P-H line of commercial refrigerators and freezers include:

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- ☆ Exclusive "Grad-U-Matic" Self-Defrosting Air Conditioning.
- ☆ Tubular Electric-Welded Steel Frames.
- ☆ Heavy Fiberglass Insulation.
- ☆ Solid or Triple Thermopane Doors.
- ☆ Self-Contained or Remote Control.

MODEL SA 15-15 Two-Temperature Refrigerator

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MODEL P 66-3 Self-Contained

Also AVAILABLE — A complete line of Reach-In, Pass-Thru and Salad Refrigerators . . . Upright Storage Freezers . . . Baker's Freezers and Dough Retarders . . . Dairy-Delicatessen Cases . . . Two-Temperature Refrigerators . . . 22 to 96 Cu. Ft. Capacities . . . Dry Beverage Coolers . . . and Walk-In Coolers and Freezers.

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## Los Angeles Strike--

*(Concluded from Page 1, Col. 2)*

ers working in violation of the order. A number of firms served with copies of the order have ceased working.

Contempt citations against at least six contractors still working were being prepared last Wednesday for the judge's signature. One of these is a member of the association.

Another favorable turn from strikes in the construction industry here was reported Wednesday when the hod carriers settled. Plumbers are still on strike. Refrigeration journeymen are working under a contract negotiated earlier this year.

The court has denied a petition of the sheet metal unions which asked that Chairman Henry B. Ely of the Sheet Metal Trades Administrative Council be ordered to sign vacation checks for striking employes where the employer had not cosigned the request for payment.

The court also dismissed attempted proceedings of the unions to remove Ely as a trustee of the health and welfare and vacation funds.

Biggest of all meetings of the industry, on July 25, was attended by almost 300 contractors. With one or two exceptions, contractors were unanimous in standing firm against "unreasonable" union demands.

## Denver Suit--

*(Concluded from Page 1, Col. 3)*

union gave the association an oral agreement that the union would bargain exclusively with the association and would not bargain with any individual contractor.

In alleged violation of the agreement, according to the suit, the union negotiated a contract with Dowdel Sheet Metal Co. and F. W. Willoughby Co. As a result of this, the suit said the members of the association were forced to enter into contracts and were damaged in the sum of $60,000.

In a second cause of action, the association claimed some union representatives led some members of the association to believe that the Dowdel and Willoughby companies had agreed to an addenda to a standard form agreement which was not approved by union members.

The association asserted no such agreement was made and by reason of this the association suffered $50,000 damages.

## Canadian Thermo Control Formed To Sell, Service Transport Refrigeration

TORONTO, Ont., Can.—Formation of the ninth company in the A. V. Roe Canada, Ltd. group was announced here.

Crawford Gordon, Jr., president and general manager, said the new company, Canadian Thermo Control Co., Ltd., has been established to sell and service refrigeration equipment for trucks and trailers, railway freight cars and tanks, buses, and ships under license agreement with the Thermo King Corp. and Thermo King Railway Corp. of Minneapolis.

Gordon will be chairman of the board of the new company and A. C. MacDonald, president and managing director of Canadian Car Co., Ltd., will be president and director.

## COOLING OFF: New York vs. Houston

*(Concluded from Page 1, Col. 5)*

at night, reports the *Wall Street Journal.*

* * *

**Hoping to entice more visitors** to the city this summer, the New York City Convention and Visitors Bureau estimates that 1,600,000 hp. of air conditioning equipment chills and dehumidifies the city's hotels, theaters, stores, restaurants, museums, art galleries, night clubs, offices, and residences.

"Biggest total of air conditioning cooling capacity of any city in the world," the Bureau brags.

What do you say to that, Houston?

* * *

**Phoenix, Ariz. policemen** have a beef about local motorists driving air conditioned cars. "They roll up the car windows, turn on the refrigeration, switch on the radio, and ride along in heat-proof comfort. But they can't hear a thing. Not even the police siren."

Ambulance and fire truck drivers voice the same complaint.

But they are not sore. They just wish they had air conditioning, too.

* * *

**Shop-Rite supermarket operators** in New Jersey now hold their bi-weekly meetings on an air conditioned bus en route to inspect the store of a selected member.

* * *

**Air conditioned train service** joining seven west European countries is the latest step toward greater European unification. The fast, deluxe trains move freely across national frontiers, eliminating many delays and inconveniences that plagued international travel in the past.

* * *

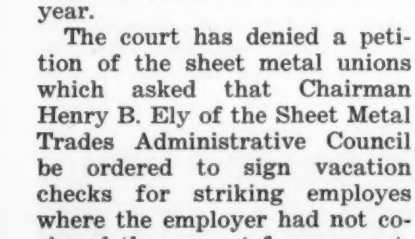
**While more and more businesses** are permitting employes to wear sport shirts to the office, the Philadelphia Saving Fund Society holds the line on neckties. "All the offices are air conditioned, so we are not imposing any hardship," comments a Society officer.

## Beer Cooler Sales--

*(Concluded from Page 1, Col. 4)*

type refrigerator display cases and counter height reach-in units destined for chain stores, supermarkets, and independent groceries.

Eventoff feels this volume directly reflects the general increased importance of take-home beer sales by the shopping housewife.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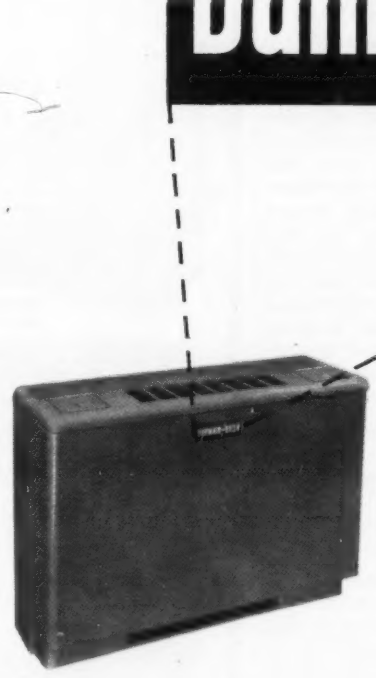

'CRV' CONSOLE UNIT

The Dunham-Bush 'CR' line of year 'round room air conditioners is available in cabinet or recessed models; vertical or horizontal models; combination water cooling and heating coils; combination direct expansion and steam coils; three control kits.

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Members of the Dunham-Bush family have been serving the air conditioning, refrigeration and heating industries for an amazing total of 167 years.

This more than a century and a half of heat transfer experience is your assurance of *dependable* products.

And you can depend on the man behind the product... the Dunham-Bush sales engineer. He's ever available... near your town... to assist you. His technical skills aid you in *three* great industries.

May we send him your way to talk about the "CR" line and other great dependable products by Dunham-Bush!

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